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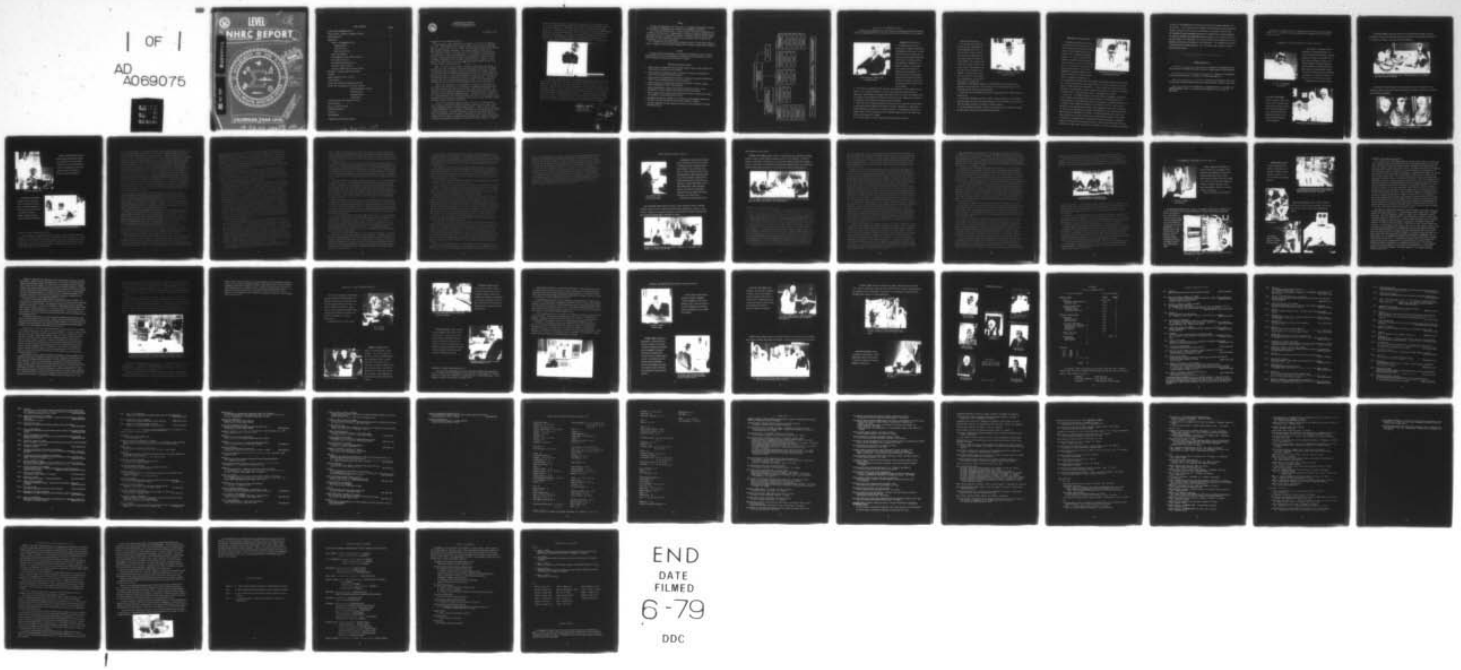

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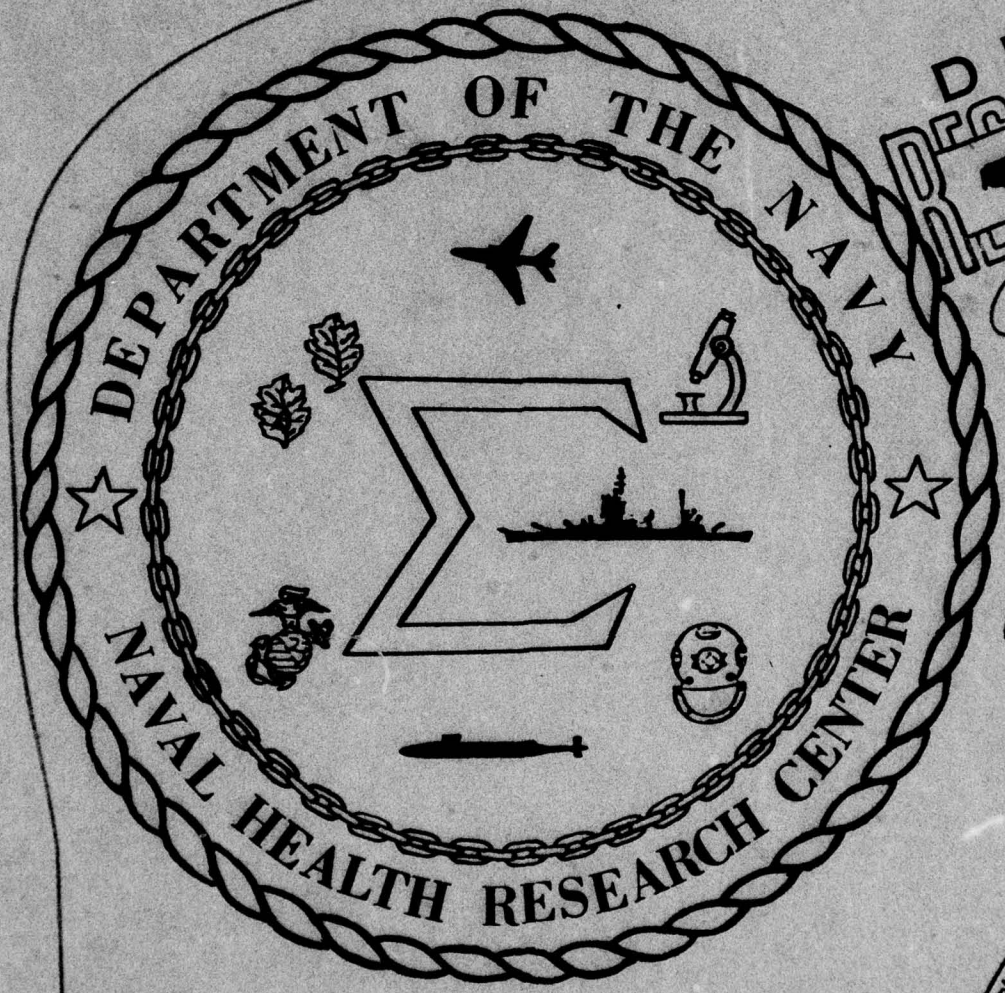
# LEVEL II

# NHRC REPORT








## CALENDAR YEAR 1978

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* Highlights now follow each division.

DEPARTMENT OF THE NAVY
NAVAL HEALTH RESEARCH CENTER
SAN DIEGO, CALIFORNIA 92152

31 December 1978

Greetings from the Commanding Officer,

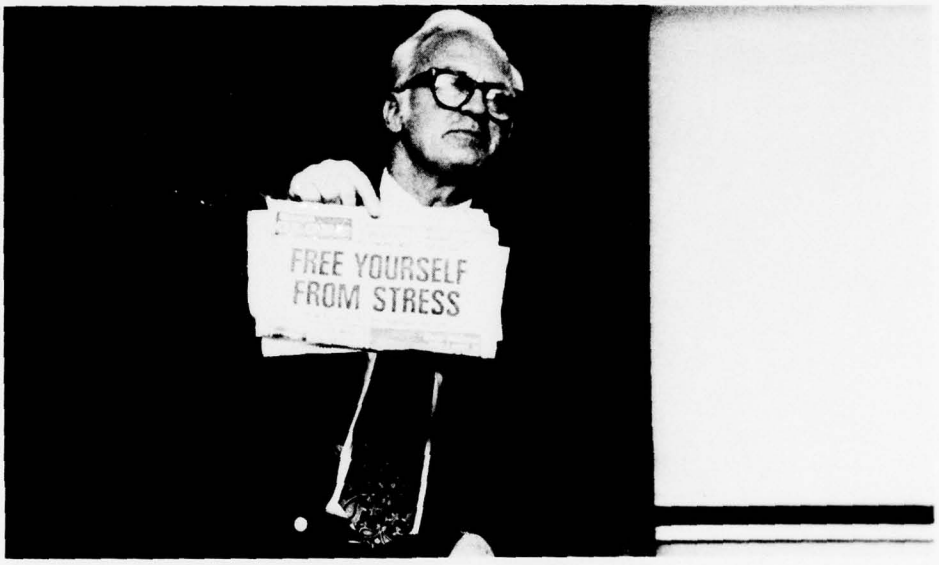
The following report documents our scientific activities for Calendar Year 1978. Naval Health Research Center (NHRC), which is one of eight Navy medical research laboratories, is under the Naval Medical Research and Development Command, Bethesda, Maryland. Our research theme continues to be: "Investigations of man in stressful military environments, with particular attention paid to health and performance." Our approach to these studies strikes a balance between psychological investigations of subjects' stress, attitudes, and morale on the one hand, and physiological studies of their health, work and sleep, on the other. We had another productive year with 63 Center reports and publications.

NHRC is located on Point Loma in San Diego, California. We occupy, in tenant status, six of the Naval Ocean Systems Center's "barracks" buildings. Our administration and library services are Building 306; computer services are located in 309; Environmental Physiology Division is in 315; Biological Sciences Division is in 331; Stress Medicine Division is located in 346, and Environmental and Social Medicine Division is in Building 332. The Center also has space at the Naval Regional Medical Center, on the third deck of Building 39, and at the Naval Training Center, upper deck of Building 27.

Despite our dispersion, our researchers are located in the middle of San Diego's fleet activities. Just below us is Submarine Development Group Five and across the bay is Naval Air Station, North Island, Coronado. We continue to study underwater demolition team trainees who reside a few miles down the coast at the Naval Amphibious Base. Saturation divers, another of our study populations, are located virtually next door to us at Ballast Point. Researchers also continue to investigate the stresses of Navy and Marine Corps recruits located a few miles south of us.

Several distinguished scientists have visited us over the past year. Some of these visitors were asked to present a lecture to all hands as part of the Commanding Officer's Scholar Seminar Series. These lecturers were: R. Charles Kaufman, M.D., Professor of Psychiatry at the University of Colorado School of Medicine, a pioneer researcher in the area of primate studies of early environmental factors leading to depression in later life, and also a leading expert in models of human stress and adaptation. Robert M. Rose, M.D., Professor and Chairman, Department of Psychiatry at the University of Texas

School of Medicine, Galveston, presented an overview of his and others' work on the psychological and physiological consequences of occupational stress in air traffic controllers. Professor Holger Ursin, Institute of Physiology, University of Bergen, Norway, presented a review of his book on psychobiological adaptation in paratrooper training. James P. Henry, M.D., PhD, Professor of Physiology and Biophysics, University of Southern California, Los Angeles, lectured to us on biochemical mechanisms linking stress and illness. A picture of Dr. Henry, holding important reference material, is shown below.




We had some retirements this year of NHRC personnel who had been with the Center a very long time. William K. Wright, our Administrative Officer since the Center's inception in 1959, retired with 36 years of Federal Service. In addition, Commander Newell H. Berry, MSC USN, retired from active naval service this past spring. John A. Plag, PhD, Director of the Center for Prisoner of War Studies since its beginning in 1974, and a research scientist and division head with NHRC since 1960, retired in the fall. Edna Hunter, PhD, resigned this fall to take a teaching position at the United States International University, San Diego. Last, but not least, our librarian, Dorothy Swett, the very first civilian to be hired to our staff in 1959, retired in December.

RICHARD H. RAHE
Captain MC USN
Commanding Officer

## PREFACE

The Center was established 1 June 1959 as the U.S. Navy Medical Neuropsychiatric Research Unit by authority of SECNAVNOTICE 5450, OP-09B23, Serial 360P09B2 of 8 May 1959.

The original mission was defined: To conduct research in the area of neuropsychiatry as it applies to the naval service. Implementation of this mission eventually expanded research into preventive and clinical psychiatry, neurology, biochemistry, infectious disease, psychophysiology, and social psychology, as they relate to the medical aspects of physical and psychological stresses of naval environments.

On 1 September 1974 the command officially changed its name to the Naval Health Research Center. A broader mission was assigned consonant with the Center's growing research capability.

## MISSION

To conduct research and development on the medical and psychological aspects of health and performance of naval service personnel; and to perform such other functions or tasks as may be directed by the Chief, Bureau of Medicine and Surgery.

## FUNCTIONS IN SUPPORT OF MISSION

a. Conduct research on demographic and sociological factors related to health patterns and related behavior among naval service personnel.

b. Conduct research on psychological stress in relation to illness and maladjustment in naval service occupations and duty environments.

c. Conduct research on psychophysiological aspects of health and the physical and emotional fitness for work performance among naval service personnel.

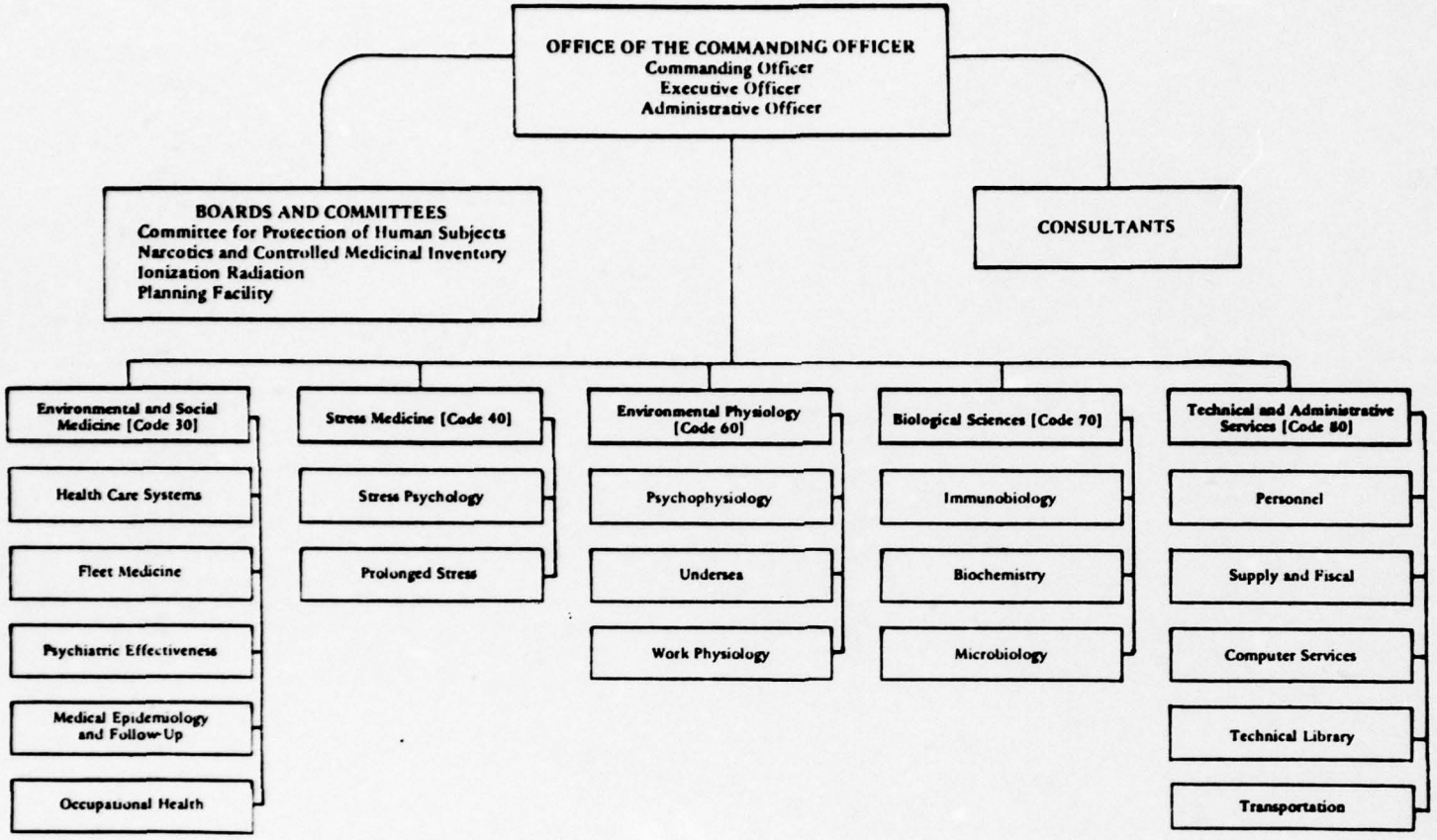
d. Conduct research on the epidemiology, prevention and control of infectious diseases affecting performance of naval service personnel.

e. Conduct epidemiological research on the biological and physical aspects of naval environments in relation to health and safety of naval service personnel.

f. Conduct research on the long-term health and behavioral effects of combat and prisoner of war experience on the serviceman and his family.

g. Disseminate the results of research in such a manner to insure adequate communication with naval activities concerned and the scientific community in general.

h. Provide or undertake such other appropriate functions as may be authorized or directed by higher authority.




| 12/31/78 | Approved<br>Richard H. Rahe, CAPT MC USN<br>Commanding Officer | NAVAL MEDICAL RESEARCH AND DEVELOPMENT COMMAND | NAVAL HEALTH RESEARCH CENTER SAN DIEGO, CALIFORNIA 92152 |
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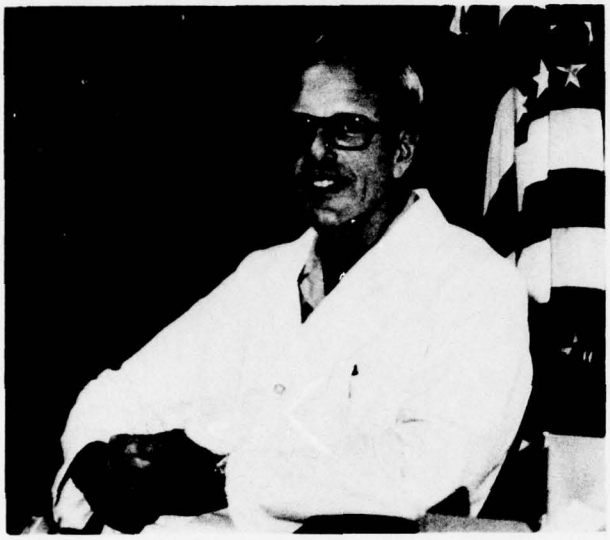
## OFFICE OF THE COMMANDING OFFICER

The Office of the Commanding Officer shall consist of the Commanding Officer, the Executive Officer, the Administrative Officer, and other staff and clerical personnel as may be required.



Captain Richard H. Rahe, MC USN
Commanding Officer

### COMMANDING OFFICER [Code 01]

1. The Commanding Officer (CO) is charged with the command, organization, and management of the Center. He shall require the timely and economical performance of the functions and operations of the Center in accordance with U.S. Navy Regulations, the Manual of the Medical Department, and other directives issued by those within the recognized chain of authority. He shall be responsible for the overall supervision of the quality and effectiveness of the Center's research and for the safety and well-being of the entire command.

2. The CO shall be responsible for the sound and legal expenditure of funds allotted to the Center for its research and operation. He shall issue instructions concerning the use, expenditure, and conservation of equipment and supplies which shall define the responsibilities of the heads of the administrative divisions and research divisions regarding the correctness of inventories and the transfer of property upon their detachment.

3. The CO may, at his discretion and when not contrary to law or regulations, delegate duties to the Executive Officer, Administrative Officer, and other subordinates, as appropriate, to the maximum extent consistent with the retention of control. Such delegations of authority, however, shall in no way relieve the CO of his continued responsibility for the safety, well-being, and efficiency of his command.

4. The CO also serves in a liaison capacity with other military activities.

EXECUTIVE OFFICER [Code 02]

Captain J. Eugene Lang, MC USN
Executive Officer

1. The Executive Officer (XO) shall serve as the direct representative of the Commanding Officer (CO). As such, all orders issued by him shall be regarded as proceeding from the CO and shall govern all persons within the command. While executing the orders of or serving in place of the CO, the XO shall take precedence over all other officers attached to the command. His primary function shall be to assist the CO in the discharge of his responsibility for the overall supervision of the quality and effectiveness of the command's research, in the formulation of professional policies, standards and directives, and in the coordination of all internal administration of the Center dealing with professional research matters.

2. The XO shall direct the Administrative Officer regarding matters of common interest and responsibility.

3. The XO shall coordinate the various scientific research and activities of the Center, under the guidance of the CO, and advise researchers as to the timeliness, naval need, and requisite support available for the Center's research proposals.

4. The XO coordinates the Center's interactions with other Bureau of Medicine and Surgery and Naval Medical Research and Development Command programs.

## ADMINISTRATIVE OFFICER [Code 03]

Commander William A. Ferris, MSC USN
Administrative Officer

1. The Administrative Officer (AO) shall be responsible to the XO and the CO for all administrative matters including the coordination of internal administration of the Center as well as management improvement functions. All orders of the AO shall be regarded as proceeding from the CO, whose orders and policies he shall conform to and effect. He shall advise the XO and the CO regarding nonprofessional functions and management of the Center, and shall assist them in the formulation of administrative policies, standards, and directives. He acts independently upon matters which do not require the personal attention of the CO or the XO, and keeps the XO apprised of the action he takes. The AO shall advise the XO regarding matters of common interest and responsibility. He shall exercise due caution to assure that all matters of a professional or research nature which may come to his attention are promptly referred to the XO. The AO shall be an officer of the Medical Service Corps.

2. The AO shall: (a) Establish methods for improving operating procedures, solving administrative problems, and correcting unsatisfactory conditions of an administrative nature. (b) Be responsible for the coordination and efficient operation of the administrative division. (c) Maintain current information regarding laws, regulations, policies, and instructions pertaining to naval administration in general and to management of this Center in particular. (d) Provide for the preparation, promulgation, and maintenance of the directives necessary to meet the operating requirements of the Center. He shall have general orders, orders from higher authority, and all other directives and information which concern or are of interest to personnel of the command posted on conveniently located bulletin boards, or otherwise brought to the attention of the personnel concerned. Copies of the Uniform Code of Military Justice shall be made readily accessible to all personnel. He shall insure that all infractions

of law or U.S. Navy Regulations and violations of discipline are promptly reported to the XO and the CO. (e) In consultation with the Head, Fiscal and Supply, and other appropriate personnel, formulate fiscal policies for presentation to and approval by the XO and CO. (f) Promulgate directives concerning safety measures and precautions, including procedures for protecting personnel and safeguarding government property. (g) Arrange for the care and safe custody of all Center keys. (h) Insure compliance with the provision of U.S. Navy Regulations pertaining to the security of classified matter. (i) Coordinate the activities of the Office of the Commanding Officer. (j) Provide for proper military and civilian personnel administration.

****

## BOARDS AND COMMITTEES

The *Committee for Protection of Human Subjects* is appointed by the Commanding Officer under provisions of SECNAVINST 3900.39A on Protection of Human Subjects in Medical Research.

The *Narcotic and Controlled Medicinal Inventory Board* is appointed by the Commanding Officer under the provisions of the Manual of the Medical Department 21-4.

The *Ionization Radiation Control Committee* is appointed by the Commanding Officer under the provisions of NAVMED P-5000, Radiation Health Protection Manual, Chapter 4, Section 4-1.

The *Facility Planning Board* is appointed by the Commanding Officer in accordance with NAVMEDRSCHDEVCOMINST 11000.1 to review and make recommendations to him on facility improvements.

NHRC, under its Commanding Officer, is organized into four scientific divisions and one support division. Highlights of research completed during calendar year 1978 follows each scientific division.

## ENVIRONMENTAL AND SOCIAL MEDICINE DIVISION (CODE 30)

Dr. E. K. Eric Gunderson
Division Head

This division is concerned with the distribution, precipitating factors, and long-term course of major diseases, including psychiatric disorders, in the naval service. Other areas are diagnosis, prognosis, and treatment methods; personality assessment and classification; the effects of environmental hazards and organizational stresses on physical and mental health and performance effectiveness, and factors that affect the quality and cost of health care services.

Branches under this division include:

HEALTH CARE SYSTEMS BRANCH conducts studies of illness and injury rates in relation to age, occupation, duty station environment, and service history variables, including prospective longitudinal studies of life changes and health patterns in career personnel.

Anne Hoiberg, Steve Berard, and John Ernst

FLEET MEDICINE BRANCH studies the effects of mission, operational schedules, physical environment, and social and organizational factors on morbidity and performance effectiveness of individuals and groups in ship and shore duty assignments.

(left to right) Vickie Williams, Larry Hermansen, Ralph Burr, Linda Dutton, Bill Pugh, LT Butler (standing)

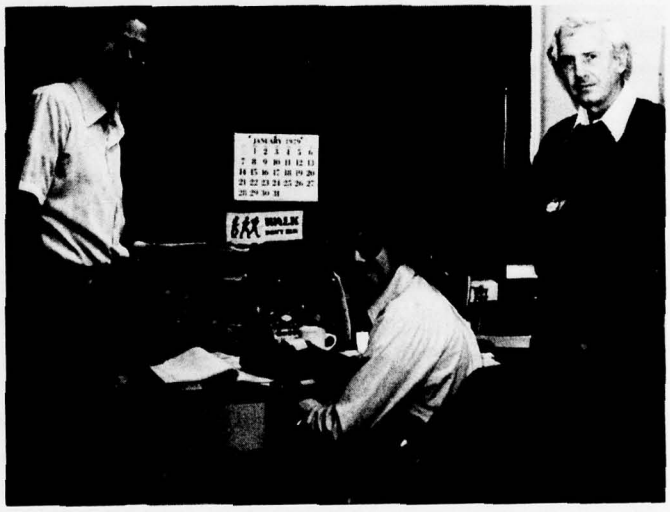
PSYCHIATRIC EFFECTIVENESS BRANCH determines incidence, course and outcome for major psychiatric conditions and devises improved diagnostic and prognostic guidelines for effective classification and treatment.

Tommy Thompson, LCDR Ferguson, and LCDR Bailey

Bud Miller and Jean Beck

MEDICAL EPIDEMIOLOGY AND FOLLOW-UP BRANCH designs and maintains computer files of medical and service history information for all naval personnel as a basis for epidemiological and longitudinal studies of morbidity and mortality in naval environments.

*OCCUPATIONAL HEALTH BRANCH* conducts studies of biomedical risks in various naval environments, including determination of morbidity and mortality rates as a function of physical hazards, personnel characteristics, and preventive programs.



Dick Booth, Doug Reeves and Mike McNally

Highlights of research completed during 1978....

From the standpoint of operational planners and leaders, illness is perhaps infrequently thought of as a personnel problem. Yet a man or woman not at a duty station because of illness or accident is just as absent as one who has overstayed leave or has fled--even though absence without leave is illicit and illness is honorable. Focused efforts to determine the scope of illness problems and to develop preventive programs from such study are major efforts of the Division of Environmental and Social Medicine.

Many social changes also involve medical changes. The decision to double the proportion of women in the Armed Forces carries with it an implication of demonstrable changes in health and in preventive and treatment aspects of health care delivery. Women's patterns of illness, because of the cycle of menstruation, conception, birth, and lactation, differ from men's. The NHRC research files, based upon the world-wide statistics of the Naval Medical Data Services Center in Bethesda, reveal over a period of years trends in illness and accidents data. Young women of the age appropriate for service in the Navy or Marine Corps, have more reportable illness than young men of the same age. In the Navy some of this is the result of the facilities available--it is more awkward to have a female on the binnacle list. But beyond that there are biological differences involving susceptibility; stress factors possibly linked to ambigious sex role expectations, including the use of illness as a response to frustration and role conflict; life style differences--men, for instance, may have more hazardous jobs and thus more accidents; and physicians may manifest different ways of diagnosing men and women. For three years, 1973, 1974, and 1975, uniformed women showed declines in at least three major categories of illness, but showed a substantial increase in pregnancy-related conditions. Ratings (type of job) also related to illness, as the hospital corpsman, both male and female, have higher incidence than do other ratings. Rate (pay grade) comparisons show higher illness incidence for the lower pay-grades, E-1 through E-3 (who are also younger in age) than the higher grades, E-5 through E-9 (who are older) (78-1).

Women show two to three times the hospitalization rates of men for the majority of diagnostic categories. While some of this results from physicians being more protective of women or more receptive to their complaints (with women currently comprising only 4% of the forces, doctors may pay more attention to them because they see fewer of them), much of it is a real difference. Illness means not only days lost from the job, it can also mean separation from the service before an enlistment is completed. Knowledge of the trends should help Navy physicians understand how the stress of military life affects women differently from men. The mental illnesses account for a sizable proportion of this (78-1).

While all this sounds like a good bit of sickness (e.g., one million hospital days during 1975, although only 605,000 during 1976), it is a pretty good record considering the number of people involved--indeed, the fleet is very healthy--and the rates are declining. Even in diagnoses limited to women, there are recent declines (except for deliveries). And of women who had abortions, 60% remained on active duty; of women who gave birth in naval medical facilities, 62% remained on active duty. Of course, giving birth is not an illness, but the process does require some lost days, and many separations from the service (78-7).

Hospitalization for different racial groups within the Navy shows wide differences, Filipinos (Malaysians) have easily the lowest rates--about one-third the rate for blacks, possibly because of better selection procedures and assignment to jobs that are less dangerous. Interestingly, part of the high black rate comes from surgery for non-life-threatening conditions, suggesting that the Navy provides needed corrective treatment (78-49).

Among the conditions that pose little or no threat to life, but account for disproportionate man days lost from work are mental illness, alcoholism, and drug abuse. Who are likely to be affected by drinking or drugs to a degree that leads to time lost and to hospitalization? A survey of sailors admitted to a Naval Drug Rehabilitation Center and to four Alcohol Rehabilitation Centers shows that they are average in age, schooling, and intelligence, but more alcohol abusers

than drug abusers return to duty after therapy, with about one-third of the drug abusers actually getting back to their jobs. It is possible, before treatment, to identify with some confidence those who will profit most from such treatment. A fair proportion of the sailors who abuse alcohol or other drugs suffer from emotional instability, neurotic symptomatology, and unhealthy attitudes to authority. It may well be that appropriate therapeutic programs can be arranged according to the individual's basic problem rather than to the substance abused, although most alcoholism counselors and drug therapists feel that their programs ought to preserve their particular identity (78-60).

For some young men who develop alcoholic behavior patterns, the alcoholic beverage is their sole mode of abuse. Others extend their behavior to other drugs. A three-year study 1975-1977, of sailors aged 25 or younger, compared two groups. Those who got involved with other drugs tended to have higher alcohol use, to use marijuana, to have friends who used hard drugs, and to enjoy becoming intoxicated. Otherwise the groups were much alike. A drug culture facilitates use of more drugs than just alcohol (78-61).

A personality test of considerable promise was used to illustrate some of the differences in outcome in rehabilitation of alcoholics. The Comrey Personality Scales were administered to 4,078 Naval enlisted men. Participants at rehabilitation centers and alcohol rehabilitation services showed more psychological change than those treated at local command drydocks. Personality changes were largest on the scales for Trust, Anxiety, Activity, Emotional Stability, and Extraversion. Prior to treatment the scale for Social Conformity best distinguished the effective from the non-effective participants (78-47). For patients admitted to alcohol rehabilitation programs, the best predictor of successful outcome was paygrade, along with attitude toward the service and a history of few disciplinary difficulties (78-48).

Alcoholism can be an additional, complicating problem if it happens to be found in a patient admitted to a hospital for medical reasons other than alcoholism. It is well known that liver disease, gastrointestinal disorder, traumatic conditions, and some malignancies are found frequently among alcoholics. The Michigan Alcoholism Screening Test was used with volunteers at the San Diego Naval Regional Medical Center dermatology and gastrointestinal services. More than one-fifth were classified as alcoholics by the MAST norms and another 25% could be considered possible alcoholics. The test is thus useful in identifying young men with potential for alcoholism (78-62).

The motivational determinants of illicit drug use were investigated in a population of 867 enlisted men who entered the Naval Drug Rehabilitation Center, Miramar, during 1971 and 1972. They were young, ages 20 to 25 mostly, and half were Vietnam veterans. Hierarchical multiple regression procedures led to the emergence of four major components: insight-seeking, which included seeking personal identity, self-understanding, closeness to others, and meaning in life; therapeutic needs, including alleviation of symptoms or coping with adjustment problems; sentience, involving seeking of sensory stimulation and psychedelic experience; and pleasure seeking, including pleasurable experimentation with drugs and enhancement of group enjoyment. A general factor, called general sensation seeking, accounted for 65% of the variance in the original solutions. Behaviorally-based criteria of drug involvement are enhanced by the inclusion of stable indicators of motivation for drug use (78-16).

Understanding of neurosis, in civil or military life, is handicapped because of the relative lack of good, long-range studies. The military services, who rarely or never lose

track of a member, provide a possible group for study and so a longitudinal study of 19,861 patients admitted to naval medical facilities during calendar years 1966 through 1969--of whom 4,074 were diagnosed neurotics, was undertaken. Prognosis was best for anxiety neurotics, followed by hysterical and depressive patients. Phobic/obsessive patients had the least favorable prognosis (78-55).

A psychiatric diagnosis of wide usefulness in the young, adult population typical of the Armed Forces is transient situational disturbance--a category physicians use to describe the acute reaction to overwhelming environmental stresses. In the years 1966 through 1969, 2,078 male personnel hospitalized with this diagnosis were followed back to duty. Rehospitalized were 27% within the next four years. Fully effective back at duty were 59%. It is suggested that this diagnosis may sometimes be used when the actual diagnosis is unclear or when more serious conditions may be present but the psychiatrist does not want to stigmatize the patient (78-57).

A physicial condition, very typical of American civil life, is also found to some extent in the military--obesity. Since obesity interferes with optimal performance in most Navy settings or is presumed to lessen performance, the Navy sponsors weight reduction programs. For both "people" and a few other "things", information about eating behavior, history of weight problems, activities, and feelings about food and dieting was collected and analyzed. The strongest correlates of obesity were overweight history, food obsession, and activities--with multiple Rs of .49 for overweight Marine Corps recruits, .46 for another male sample, and .32 for women. Some personality factors are related to weight loss and to maintenance of weight loss (78-50).

Even in a population as generally healthy as active duty Navy personnel *cancer* extracts a measurable toll in days lost and even in death. All cancer admissions for a period of 11½ years--5,675 men and 364 women--were analyzed. For younger men, incidence rates were highest for cancer of the testis and Hodgkin's disease; for older men lung and skin cancer were more often found. For women, cancer of the breast and reproductive system showed highest incidence. While incidence rates for men were fairly stable over 1966-1976, mortality rates showed a substantial decline (78-56).

A brief, 20-item questionnaire used in many NHRC studies because of its nonthreatening character as well as its brevity is the Health Opinion Survey, which was scrutinized in two 1978 researches to determine the utility in clinical situations, its factor structure, dimensionality, reliability, and validity. Results on the scale reflect physical as contrasted with psychological distress dimensions, when used with populations of sailors seen at Navy outpatient clinics for psychiatric evaluation. Three interpretable dimensions emerged: depression, anxiety, and somatic concerns. These dimensions possess both empirical and clinical validity (78-29; 78-54).

What sort of sailors get sent to Navy clinics for psychiatric evaluation? For the year 1972, the 17 Navy clinics provided a sample of 2,433 enlisted men. The biggest group, 53%, were experiencing adjustment difficulties which jeopardized the individual's position in the military. Other referral sources were (for less than one-third of the sample) individual problems like depression, or fears, or personal distress where one might presume that psychotherapists intervention would be helpful. Generally the outpatient clients were young and inexperienced. It was noted that 38% of the sample were not working in the area of their specialty and training (78-41).

The difficulty of obtaining reliable data about medical conditions aboard ship and at other stations where very brief sicknesses are not uncommon and binnacle lists are of doubtful reliability, has led to the development of a new outpatient data collection system--brief enough to be acceptable to doctors and corpsmen, comprehensive enough to provide data useful in planning medical care delivery services, and valid enough to permit epidemiology and research data (78-9; 78-59).

The corpsman is a critical person in the military health care system. Some 1,000 were queried about the system's best use of enlisted health care personnel, their assignments, and working conditions (78-36). Predictors of effectiveness in the rating of corpsman can be facilitated by use of the Navy Vocational Interest Inventory and of a six-item scale of preferences for Navy health care work. These two correlated .51 with each other and .28 and .27 with effectiveness on the job (78-8).

A methodological study of the Comrey Personality Scale, using Navy populations, revealed satisfactory levels of validity and reliability (78-40).

Aboard a deployed vessel, as any experienced person knows, a constant feature of the life is crowding. If crowding is defined as the response to physical limits of the space available and privacy is regarded as somehow related to information exchange, how are the two related? Studies aboard three deployed amphibious ships showed the usefulness of the two concepts and illustrated how privacy can be achieved aboard a crowded ship (78-46).

Among all the environmental factors which affect morale, one of the most pervasive, and at the same time difficult to assess must be the influence of the organization. It has been known for some decades that ships with high morale have low incidence of sick call (and of absenteeism). What are the relationships between various identifiable organizational factors and such things as accidents, illnesses, etc.? What is the relationship between organizational experience and the perceived behavior of the leader? The salience of particular leader dimension may differ in differing organizational or situational conditions. Experienced workers know more about their jobs and roles and thus need less structure and more counseling from their leaders. Workers of less experience need more job structure. Seventy-five per cent of the crews of three large ships on an eight-month deployment voluntarily participated in studies of perceived leader behavior and work environment. High and low tenure workers do indeed perceive their leaders differently (78-30).

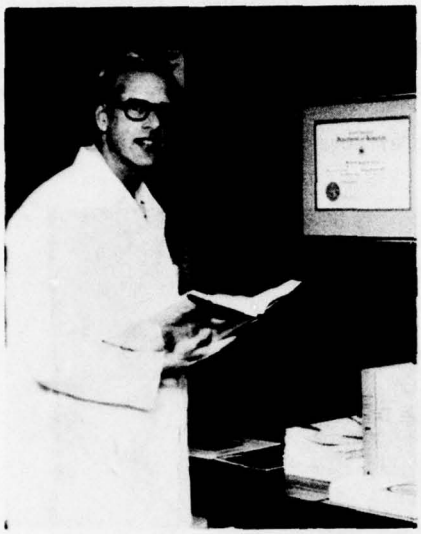
Not a little of the difficulty in applying the concepts of organizational psychology to actively functioning systems lies in the fact that some of the basic concepts--psychological climate is a good example--are theoretically ambigious and are confusing when applied to organizational sub-systems. Perception by the individual depend on his place in the organization, his characteristics, and other factors (78-39). The use of aggregated perceptual scores to describe organizational conditions is suggested. Work environment perceptions (that is psychological climate) were explored in a variety of situational positions and individual measures. Five of six dimensions found to underlie the perception of 4,315 enlisted men on 20 ships were generalized to comparison samples of (398) firemen and (465) health care managers (78-42).

How often is it alleged that there is a conflict between a sailor's work role and his family life? A sample of 181 married sailors aboard four vessels at sea responded to questionnaires about job-role conflict and ambiguity, goal attainment facilitation, role strain, and

*family-work role incompatibility.* For many occupations work time commitments may be unrelated to family role performance. The occupational time demands on a sailor, however, are a great deal larger than for most occupations. So when a sailor moves from shore duty to duty aboard a vessel at sea, the transition in roles may be difficult for him and for his family. Attitudes toward the job, toward the Navy, and even toward eventual re-enlistment are related (78-34).

About 6% of Navy men detailed overseas fail to complete their tour of duty owing to problems of adjustment, and early return to the United States often signifies severe personal or familial stress. The cultural shock of Midwestern family arriving in Naples or Manila is not a new phenomenon but the focalized Navy attention to the problem is. The difficulties center around relocation, or language deficiency with resulting social isolation, the financial strain with the weakened dollar in a foreign area, and the children's adaptation to school. Suggestions for screening are made with different criteria depending on the level of the service assignment, the location, and other factors (78-58).

## STRESS MEDICINE DIVISION (CODE 40)



Dr. Richard H. Rahe
Acting Division Head

Psychological, social, and physiological factors associated with stress are studied to determine positive and negative associations between stress, performance, and health. Groups selected for study include Navy populations in high stress occupations (e.g., pilots, divers), in specific high stress situations (e.g., recruit training, captivity). Studies which relate stress in these populations to short-term health effects, also search for physiological mechanisms which may connect these stress situations with illness onset.

Branches under this division include:

STRESS PSYCHOLOGY BRANCH emphasizes studies of acute responses to stress situations. Different types of stress are measured along with human's physiological reactions to these stresses. Studies also investigate the effects of psychological and social variables which may increase or decrease human's tolerances for stress.

(seated, l-r) Ross Vickers and Linda Hervig. (Standing, l-r) Dave Ryman, Terry Conway, Kevin Scoggin, and HM3 Yumol.

Stress Medicine Division (cont.)

**PROLONGED STRESS BRANCH conducts studies of individuals who have experienced prolonged periods of stress, to understand the cumulative effects of this experience. Analyses of physical, environmental, psychological, and interpersonal factors are utilized to predict the positive and negative long-term health and adjustment sequelae of this stress experience. Extended studies permit elucidation of slowly developing effects of stress exposure.**

**(l-r) Hal Cadena, Dan Palermo, Barbara McDonald, LCDR Shale, Dr. Richlin (standing), Major Van Vranken, Dana Robinson, and Dorothy Benson**

Highlights of research completed during 1978.....

Long-term follow-up of patients who have had a life-threatening illness is essential in the appraisal of the effectiveness of treatment used. Morbidity as well as survival information is needed. Even though patients move about and hospital staffs have turnover of personnel, it is possible to follow individual patients for some years. A series of patients treated at the Naval Regional Medical Center, San Diego, provides encouraging information about the treatment and follow-on status of myocardial infarct survivors. After stabilization of status following the attack, patients were included in a broad program of education; group discussion; life and job planning, with emphasis upon compliance with medical advice on diet, especially cholesterol reduction; weight reduction; the modification of behavior related to life stress factors in heart disease, such as avoidance of overwork, reduction of feelings or urgency of time deadlines, and general dissatisfaction with conditions of life. While differences between the experimental patients, who had the full program of therapy and discussion, and the controls, who had the same first-rate medical care and the general advice, were measurable, it was noted that some differences were noticeable three months after the attack, while other differences were more marked three years afterward. Modification of behavior significantly related to heart attack is not only possible--it is positively indicated and shows dramatic results (78-53).

Environmental and social aspects of illness were investigated in a population long of

interest to Captain Rahe. Using a coronary behavior questionnaire, rural (East and West Finland) were compared with city dwellers (Helsinki). When controlled for prevalence in coronary heart disease, East Finns showed more time urgency behavior and more striving than West Finns, and less work dissatisfaction. Such work dissatisfaction was negatively related to striving and time urgency, as well as to autopsy evidence of heart disease in coronary death victims. Urban post-myocardial infarct survivors had more striving and time urgency behavior than did rural citizens (78-10).

Monitoring of stress during training has been carried out at NHRC for many years using psychological, physiological, and biochemical methods, with recruits, underwater swimmers, drill instructors, and other populations where there is reason to suspect that the arduousness of the training or the danger involved might be presumed to result in high levels of stress. A population of great interest consists of pilots undergoing replacement air group training, who were compared with the radar-intercept officers (RIO). In the F-4 aircraft the pilot sits in front and controls the aircraft; the RIO sits behind him and has no direct flight control, but operates all electronic equipment and specifies course and maneuvers necessary for accomplishing the mission. The first day of familiarization, the first F-4 flight, computer simulation of electronic and radar operation, the first flight using radar weapons, and the first mission including delivery of ordnance were measured. Blood draws were made before the flights and urine samples collected at the end of each, and a Recent Life Changes Questionnaire administered. For the pilots the most stressful phase was the first F-4 flight; for the RIO it was the first radar trainer. All biochemical measures were within normal ranges for all phases but peaks of these measures coincided with peak stress days for pilots and RIOs (78-63).

Enforced movement of people because of war or politics has been too frequent a feature of twentieth century life. The psychological risk to children during such movements is especially disquieting. At the time that 160,000 Vietnamese were evacuated to the U.S.A., many were temporarily moved through a facility which was constructed at Camp Pendleton in 24 hours. Routine medical care for the evacuees was provided by Regional Medical Center, Camp Pendleton (and physicians from among the refugees) and consultative service for mental health needs by a team from NHRC. The essential function was to translate knowledge of familial and extra-familial factors that influence growth into recommendations that had common sense validity for those people who had managerial responsibility but no previous experience in dealing with special needs of children (78-13).

Effects of family separations of greater duration than the seven or eight months of peace time deployment were studied in the continuing assessment of the former prisoners of war from Southeast Asia. These studies have led to the development of hypotheses about the usefulness of current Navy efforts to provide supports for specific needs of Navy families. Some 82 families in which the husband was a member of attack and fighter squadrons aboard a deployed aircraft carrier were involved in a comparison of families living in a large city with those living in a relatively closed rural location on an air base. Two to three months before deployment of the squadron, the wives were interviewed on their awareness of the availability of support services, how helpful each service might be, and their possible reluctance to use such services. Forty to 60% of the wives were without information about services--the better informed being the spouses of career-oriented men. Reluctance was typical of wives of limited education who had negative feelings about the Navy (78-5).

What makes some families vulnerable to stress and others invulnerable is by no means fully known, but studies of particular features of the problem are possible in Navy settings and have implications for Navy life. For instance, a study of 36 families, having 53 children, identified women on the basis of androgyny, predicting that androgynous women (greater sex role adaptability, more self-esteem, greater maturity of ego functioning) would have children who adapted better to father absence than other children. The present sample failed to demonstrate the correctness of the hypothesis (78-41).

Follow-up research on the POWs from Vietnam continued during 1978. The fifth annual follow-up examination of former Army personnel, largely enlisted men, showed that 93% were still in the Army. One-fourth have experienced financial difficulties and half report job dissatisfaction. Many had personal adjustment difficulties. Eighteen months after return to the U.S.A., 35% of whose had been married at the time of capture were divorced; in 1978 this percentage was 52. Some have remarried so that eight have been divorced twice and one man thrice. Those still married, however, report a close and satisfying marital relationship (78-38).

The continuing medical examinations have included psychiatric assessments reported on a standard mental status form (78-19). The 138 naval flight officers who were returned in the spring of 1973 included 121 for whom at least three examinations allowed time comparisons of adaptation to normal living and recovery from the captivity experiences. They represent an unusually healthy group. Despite the arduousness of the captivity only four merited a formal psychiatric diagnosis at the time of repatriation. A fair number who reported transitory situational difficulties tended to resolve their difficulties in a satisfactory manner. The mental status examination score earned at repatriation correlated with later examinations in a positive position (78-51).

The hypothesis, suggested by Vice Admiral Stockdale, that individuals who are inner-controlled should do better in prisoner of war resistance than those who are outer-controlled, was tested experimentally in a series of SERE classes, using the Collins modification of the original Rotter Scale. Internals were indeed able to resist attempts of interrogators to obtain information. A subscale measuring perceived level of personal control over one's own destiny explained a greater proportion of the criterion variance than did the total locus of control instrument (78-18).

The studies of the families of the POWs gave a big boost to the study of the military family anywhere. The strains on the POW family were much more severe, of course, but all military families are subject to some stress. The studies of POW families were begun long before the return of the prisoners and were carried out in an exceptionally unobtrusive manner. They developed hypotheses about the military family now being subjected to further validation in normal samples--that is, in families whose stresses are those of routine assignment and living. Useful comparisons were also obtained from the families in which the husband did not return. In a sense the strain of families in the killed in action and missing in action was more severe than on the families of the repatriated POWs (78-44).

Absolutely critical for the valid assessment of the post-POW health of the RPWs was the information on a comparison group. Man-for-man matches for casualty date, age, year of entry into the Navy, job, schooling, marital status, rank (pay grade), number of flight hours, and type of aircraft flown allowed confidence in the findings. Later health history of both groups revealed the intriguing fact that there are a few items of health on which the

RPWs are better off than their colleagues who did not experience the captivity (78-22).

A widely known fact about the effects of the Jewish Holocaust is the influence upon the children of the survivors of the Nazi concentration camps. Because of this and because of the known effects on captives of the Japanese during World War II, with the high mortality and morbidity, it was hoped to learn something about second generation effects among the families

**Data management is discussed by Dr. Nice with Jim Phelan and Dorothy Benson.**

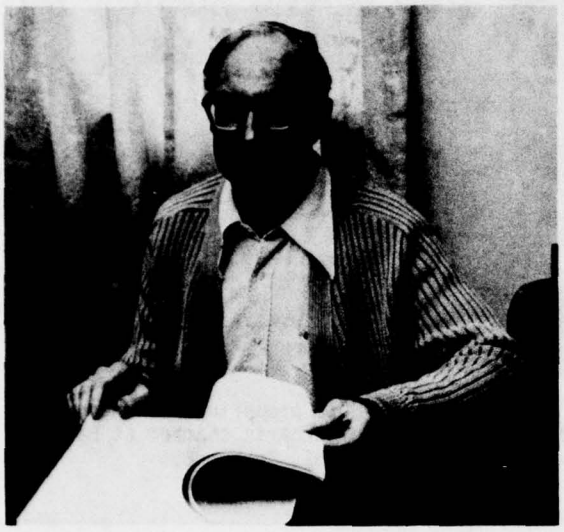
of the 1970s experience. A second follow-up suggests that some evidence of inadequate social adjustment among some of the children which had been noted earlier, had now disappeared. The instrument used, a 1930s pencil-and-paper test, is patently out of date. Other instruments now available should help clarify the status of these children who are apparently doing nicely (78-17).

The absence of second generation effects on the children of the RPWs as compared with the control group, is only one example of the reassuring outcome from the study over the years. The health of the RPWs is a more direct concern and again gratifying for the group as a whole. The implications of all the findings for the practice of clinical medicine generally and for the planning of optimal care of the prisoners are drawn in a summary report (78-33).

Another example of the usefulness of longitudinal study of health problems (and it should be remembered that this means studying the same men over a period of years--not studying the same problem for a long time with successive groups) is provided by the eighth year follow-up of the men of the USS PUEBLO. Over half of the crew members now believe that their later illnesses are related to their captivity experience. And on the Health Opinion Survey many items are checked by large proportions of the crew. Altogether, the constellation of symptoms reported is not unlike the concentration camp syndrome symptomatology (78-37).

The 1977 status of research on the military family, carried on within the Armed Forces or in universities and research institutes, is detailed in *A Report on the Military Family Research Conference: Current Trends and Directions*. The conference was held in San Diego and the volume published in 1978 (78-31).

## ENVIRONMENTAL PHYSIOLOGY DIVISION (CODE 60)



Dr. Laverne C. Johnson
Division Head

Conducts research on the effects of various stressors on the response of the human body and, subsequently, on man's performance effectiveness and his health. These stressors include, but are not limited to, factors such as sleep loss, temperature extremes, cold-water immersions, noise, hypo- and hyperbaric conditions, isolation, monotony, and fatigue.

Branches under this division include:

PSYCHOPHYSIOLOGY BRANCH conducts research on psychophysiological aspects of health, and physical and emotional fitness for work performance. The work involves both clinical and nonclinical populations. The clinical tasks include the areas of sleep disorders, selected neurological and psychiatric problems and brain cortex dysrhythmias. In the behavioral area, tasks include areas of sleep patterns, sleep loss, work-rest cycles, biological rhythms, information processing, and computer monitoring of physiological states.

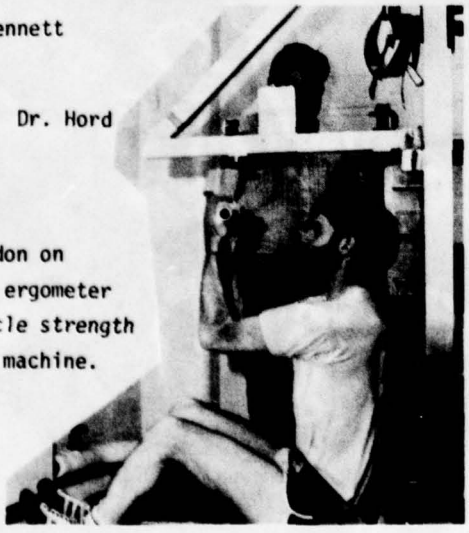
Technicians, HM2 Peace (seated) and Don Irwin (standing) monitoring data acquisition system.

UNDERSEA BRANCH conducts studies concerned with the particular psychological and physiological demands of Navy underwater swimmers, divers, and team members of underwater habitats.


Dr. Neuman and LCDR Hall preparing to conduct an experiment dive in the hyperbaric chamber at Basic Underwater Demolition School, Coronado.

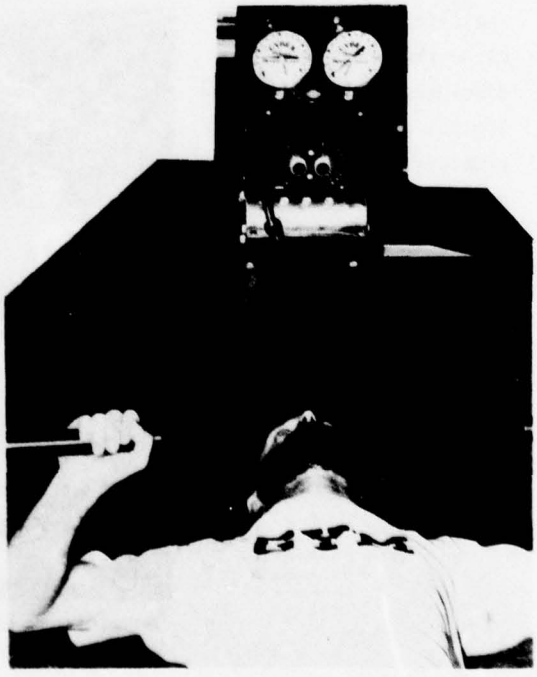

Brad Bennett

WORK PHYSIOLOGY BRANCH conducts research concerned with physical fitness, physical standards, work environments, and work load as determined by physiological indices.



Dr. Hord

LT Hodgdon on bicycle ergometer and muscle strength testing machine.



Highlights of work completed during 1978....

For a decade or more the Psychophysiology Division has centered some of its attention and effort on how monitoring of brain activity can help to understand how human beings cope with stress--especially how young adults compelled to keep performance levels high can anticipate work stress, manage it, and recover from its effects. The range of application of the knowledge resulting from such studies is impressive, for sailors and marines may find themselves in exotic environments which sap strength and vigilance, in situations where adequate rest and diet are difficult to assure, and possibly in the difficult to predict milieu of combat with its noise, fatigue, and uncertainty. Over the last few years the efforts of this division have centered on the effects of lack of rest on how sailors perform. Using fairly standard tests of performance and varying the types and duration of sleep loss or lack of rest, the division has contributed significantly to knowledge about how sleep loss degrades performance, for which kinds of performances, and what sorts of schedules or interventions facilitate recovery, so that men are restored to first class functioning. During 1978 part of the effort focused on how some variations in living schedules affect performance and on how certain drugs used to promote quick and healthy sleep do so. Arousal threshold is important to understand in order to adjust alarm systems aboard ships for example, to awake sailors in case of emergencies. Does arousal threshold have any important relationship to estimates of the quality of sleep? How are such thresholds related to the stages of sleep? Differences between volunteers sleeping in the laboratory were trivial, but differences between high and low threshold nights in the same sujbect show that high threshold nights result in feelings of better sleep (78-11). Arousal threshold was not related to subjective depth of sleep, but such ratings were related to the amount of EEG-defined wakefulness and stage of sleep.

How biological rhythms affect performance is not fully known, but for people living under ordinary sleep-wake schedules there is a strong synchronization of arousal levels, including the ability to attend to problems and to mobilize effort, cycles of performance, and oral temperature. One's body temperature peaks in early evening hours and falls to minimal levels in the early morning, say about four A.M. Now when a person's sleep-wake cycle is disturbed, by either the changing of work hours because of shift work or the demands of operational schedules, the result may affect performance. Nevertheless the basic circadian rhythms tend to persist. In 38 male Hospital Corps students, ages 18 to 22, after a baseline night of sleep in the laboratory, eight underwent a 60-minute sleep, 160-minute work schedule for 40 hours. Then other volunteers pedaled a stationary bicycle during the work periods, and 20 rested in bed during the time that the first eight were napping. The results indicate that there is no direct causal effect among temperature, performance, and sleepiness, independent of the circadian effect--that is, synchronous variation in these variables results primarily from their common link to the time of day. If in operational situations there occur relatively short-term alterations in the sleep-wake cycle or in actual sleep loss, the effect should be minimally disruptive on performance (or on temperature and sleepiness). In this experiment sleep itself increased sleepiness--and nap periods during which most sleep occurred were followed by the poorest performance. Here again, however, it is the time-of-day effect which was causal (78-2).

Advances in technology have accelerated both the recording and the analysis of psychophysiological, undersea, and work physiological data. For instance, the miniaturized four-channel cassette Medilog recorder, first reported in 1976 (see Annual Report for Calendar Year 1976) was this year combined, for analysis, with a DEC PDP11/34, producing a system of automatic sleep staging reliable enough for gross objective studies of sleep (78-3). Carried out with cooperation of Walter Reed Army Institute of Research and the U.S. Army Research Institute of Environmental Medicine a systematic review of technique and problems in the recording and analysis of brain activity was completed, including an evaluation of the validity and reliability of electroencephalographic data (78-4).

The search for electrophysiological markers which might tell when an observer, say a sailor, monitoring some apparatus aboard ship, is really alert or when his response time might be expected to be optimal continues. Two experiments involved Navy volunteers watching a "waterfall" sonar display. In the first, differences in EEG preceding long and short response times to stimuli were non-significant. In the second, a night of sleep loss was added and there resulted a correlation between EEG and long response time. It seems, however, that subject-specific criteria are necessary to identify EEG patterns associated with good and with poor performance (78-32).

An experiment studied the sort of attention manifested during focused attention using tests of visual and auditory decision tasks. Intensity ratios and phase angles do not differ between the sensory modes used but right fronto-occipital coherence is less during visual task performance than during auditory--this suggests that visual information processing reduces coherence in the right hemisphere more than in the left (78-24).

A general review of the use of physiological measures to assess the state of an operator covers both the general state, tonic activity, and the response of a subject to discrete events, phasic activity. The measures reviewed include muscle activity, as a correlate of tension, work load, and fatigue; electrodermal responses, mostly as an index of arousal; heart rate, involved in activation, arousal, attention, and information processing; respiration, as related to effort, arousal, or emotions. Problems of the demands upon the operator made by the task, the difficulty of separating out the on-going physiological activity within the organism, and wide individual differences make valid use of such physiological measures to predict or monitor performance less than satisfactory. Brain activity has somewhat more promise; although substantial changes in EEG can occur without effect on reaction time, a night of sleep loss can increase the probability that EEG changes will be associated with performance changes (78-27).

Can the goodness of sleep, whether assessed by the sleeper's post-sleep judgments or by performance after sleep, be affected by appropriate drugs? Good and poor sleepers were compared to see how flurazepam affected the process. Are poor sleepers using the drug more easily awakened by noise or have more difficulty getting back to sleep when awakened--from stage 2 or stage 4 or REM sleep? Return to sleep did take longer for the poor sleepers (78-15). Although the drug improved sleep as experienced by poor sleepers, it had additional effects. Flurazepam had no effect on volunteers' performance on a short-term memory test, but significantly impaired performance on a four-choice reaction time test and a digit symbol substitution test. Despite the subjects' views that their sleep was better and more restful, there was no significant effect on mood or on feelings of sleepiness morning or evening (78-25). The

effects of the drug on EEG show that flurazepam causes a gradual decrease in delta amplitude and count and a gradual increase in sleep spindle rate--decrease in delta being mostly in slow-wave sleep and in stage 2. The drug also decreases K-complex amplitude. The decrease in delta amplitude is associated with a reduction in the total amount of slow-wave sleep (78-28).

A test of acquired tolerance for ethanol in social drinkers stressed performance on pencil-and-paper measures, and on mood, but differences among light, moderate, and heavy imbibers were slight (78-6).

A clinically useful demonstration of the value of some of the Center's brain function research was provided by studies at the Naval Regional Medical Center, San Diego, of patients comatose from severe blunt head trauma. The brain stem auditory evoked response was measured, presenting click stimuli monaurally through headphones. Brain-dead patients had no BAER waves. BAERs done early (31 hours post-injury average) can be abnormal but follow-up BAERs (3 to 6 days post injury) corresponded with patient outcome, even when clinical prognoses were uncertain. BAERs can help assess extent of brain stem damage and effectiveness of treatment (78-52).

**Matt Sinclair, EEG Technician, prepares patient for recording of brain stem auditory evoked response. These data indicated usefulness of brain stem evoked responses in diagnosis and treatment evaluation of comatose patients.**

Monitoring the health and stamina of active divers is a constant task of medical officers and physiologists. The addition of neuropsychological tests which assay cerebrocortical functioning in a reasonably exact fashion and complement the neurological examinations and the tests of subcortical function is encouraged (78-43).

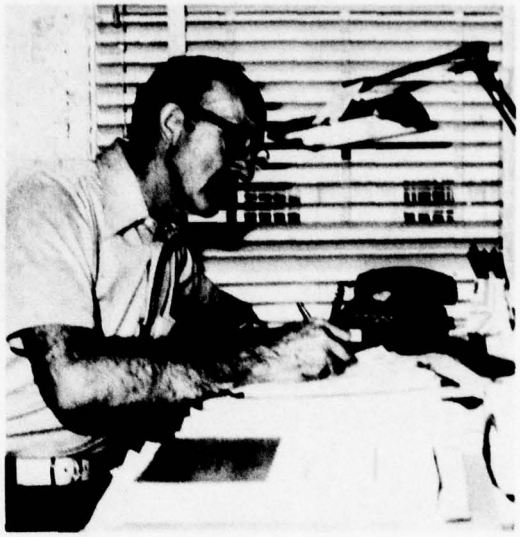
The reported improvement in the performance of long distance runners following their ingestion of high carbohydrate diets for a few days before the race has possible implications for the maximization of performance of special military groups who may be called upon for

unusual efforts in special operations. Nine male underwater and SEAL team members completed a series of tests following carbohydrate loading. Three depletion days with exercise and low carbohydrate intake were followed by two days of loading and one routine day--then they performed endurance tests on a treadmill at 80% of previously determined maximal capacity. A 9% increase was shown in length of time the carbohydrate loaded volunteers took to run to exhaustion. The technique had direct usefulness in planning for situations in which endurance may be critical (78-12).

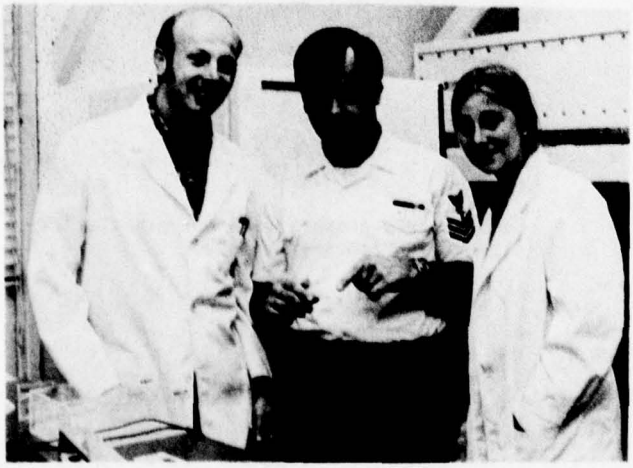
## BIOLOGICAL SCIENCES DIVISION (CODE 70)

This division investigates the biological and physical aspects of Navy environments in relation to health of naval personnel; initiates and supports studies on the effects of stress on changes in biochemical, immunological, and microbiological parameters which influence health patterns; and develops new methods and techniques for microbial identification.

Branches under this division include:



Earl A. Edwards
Division Head



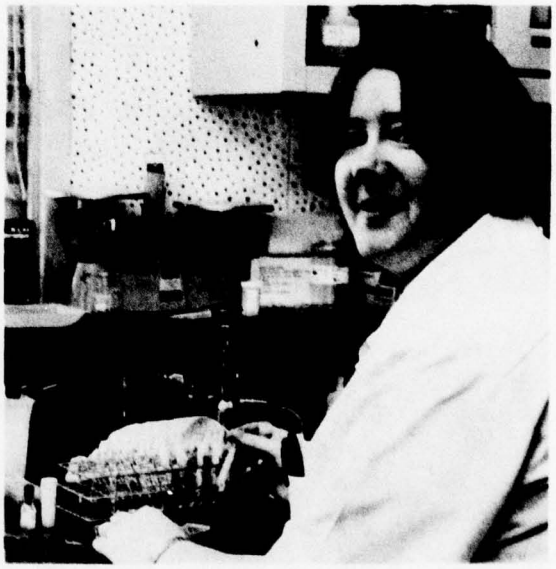
William Suiter, HM1 Mayfield and HM3 Saccani

IMMUNOBIOLOGY BRANCH conducts studies on the immune status of naval personnel. This includes studies on the effect of stress on immunocompetence, using experimental animals as models, investigates the protective role of humoral and cell mediated immune response against microbial agents, and develops rapid methods for identifying bacterial and viral agents, using immunochemical technology and validation through field studies.

(l-r)LCDR Hilderbrand, Rick Kock, HM3 Toledo, and HM2 Crisostomo

BIOCHEMISTRY BRANCH conducts studies into the effects of physiological and psychological stress on biochemical changes in body fluids; develops new techniques for measurement of biochemical constituents; and conducts investigation on correlation between biochemical changes and illness susceptibility.

MICROBIOLOGY BRANCH conducts studies on rapid diagnostic techniques for infectious diseases. A variety of microbial agents related to Navy-Marine Corps environments and needs are included in the projects. Preventive medicine aspects are emphasized through field studies of methods for early diagnosis leading toward modes for disease treatment and control.



HM2 Maynard preparing to perform counter-immunoelectrophoresis test.

Highlights of research completed during 1978...

The enzyme linked immunosorbent assay called ELISA--now an enzyme linked immunospecific assay, is accurate, quick, and adaptable to field conditions. In the diagnosis of infectious disease it is useful for the detection of antibody and also of circulating antigents. A comprehensive review of the technique is presented (78-26).

Counterimmunoelectrophoresis has demonstrated usefulness in clinical medicine--not only can antigen be detected, often with an hour of sample collection, but can be accurate even in individuals who may have had some treatment prior to hospitalization. A review of the techniques involved and of the antigens and antibodies detectable is provided, as well as a review of the techniques of Double Immunodiffusion (78-21).

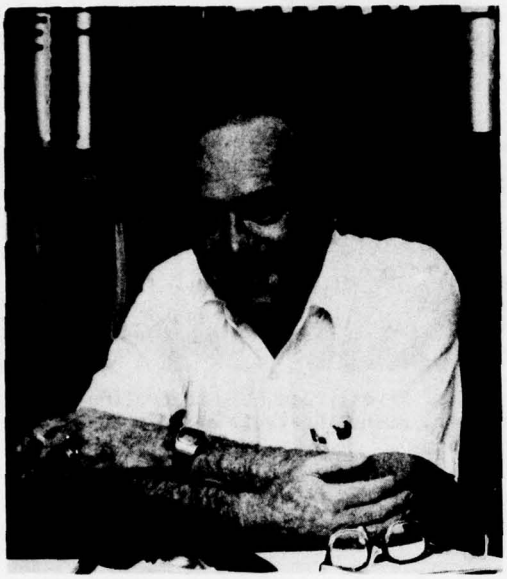
Counterimmunoelectrophoresis can detect antibody to influenza infection. Studies involving recruits, including a group of asymptomatic individuals, and one of hospitalized confirmed influenza A patients showed that influenza antibody was always associated with elevated complement fixation, but the reverse was not the case. Precipitating antibody was detected in only those individuals with influenza disease, so the test can serve as an early alert signal during surveillance of an impending influenza A epidemic (78-23).

A slide coagglutination test for the detection of pneumococcal antigen in sputum and blood serum using specific antibody-coated staphlococci was used in a study of 14 patients with pneumonia. Pneumococcal antigens could be detected in 11 of the 14, as compared with 4 of 14 by conventional culture methods, and 9 of 14 by counterimmunoelectrophoresis (78-45).

A portable, self-contained system has been developed for doing counterimmunoelectrophoresis (CID) and coagglutination (COAG) tests under field conditions, remote from any laboratory facilities. It has been tested in the field for diagnosis of cerebrospinal meningitis. Performance and durability of the system in the field have been excellent. Further field tests are in progress. This diagnostic system is adaptable to rapid diagnosis of other diseases simply by including the necessary antisera and antigens.

Portable Field Kit

## TECHNICAL AND ADMINISTRATIVE SERVICES DIVISION (CODE 80)



William K. Wright
Division Head

Provides overall administrative direction, personnel management, financial management, plant account property control, statistical service, facilities management, and transportation and messenger services through four branches.

PERSONNEL BRANCH develops and administers civilian and military personnel programs for the Center, including recruitment and placement; advises management on personnel philosophy and administration. Provides military personnel support services in coordination with the Personnel Support Detachment. Assists with management and organization analysis, public relations, and coordination of administrative services.

Mr. Bridge, Administrative Assistant, Civilian Personnel; and HM1 Martindale, Military Personnel Office.

SUPPLY AND FISCAL BRANCH plans, organizes, and coordinates performance of general, financial and budgetary accounting functions and services including payroll, timekeeping, requisitioning, work requests, project orders, and procurement and receipt of materials, supplies and services.

(l-r) Mrs. Beverly Donnell, Accounting Technician, Paul Cohan, Budget Analyst; and Jim Bennett, Head (seated).

COMPUTER SERVICES BRANCH develops and automates methods of statistical analysis related to the scientific research applications of the Center, and provides consultation to investigators.

Mrs. Joyce Ford, Evelyn Pierce, Dwayne Castleberry, Mary Paul, Bob Benites, Don Beck (head), and Barbara Watson (seated).

TECHNICAL LIBRARY provides for acquisition, receipt, identification and placement of all technical information as required by the scientific staff, furnishes resource materials and references for the investigators, and provides for the preparation of graphic materials for publication, testing, and visual presentation.


Mrs. Mary Aldous, Librarian; Ms Lucile Cheng, (Graphics and Visual), and Ms Enid Cyphert, Clerk-Typist.

TRANSPORTATION BRANCH provides transportation and messenger services. (Additional duties include assembly of scientific reports for mailout on command's mailing list.)

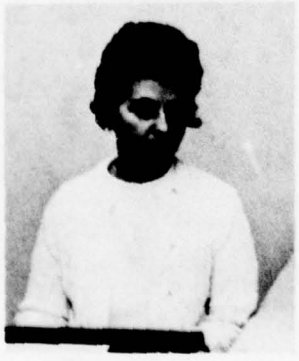
Bob Bess (seated), (l-r) Ralph Garcia, and Jim Johnson.

## ADMINISTRATIVE SUPPORT

STRESS MEDICINE DIVISION

Ms Bernice Norton
Editorial Assistant
EOB: January 1966

Mrs. Lois West
Editorial Assistant
EOB: November 1969



Ms Frances Jackson
Editorial Assistant
EOB: September 1972

OFFICE OF THE COMMANDING OFFICER

Mrs. Brenda Crooks
Secretary
EOB: July 1966

Not pictured:

Ms Patricia Polak
Editorial Assistant (Typing)
EOB August 1963, ENVIRONMENTAL AND SOCIAL MEDICINE DIVISION.

(EOB: entered on board)

BIOLOGICAL SCIENCES DIVISION

Mrs. Peggy (Schwartz) Montague
Editorial Assistant
EOB: July 1976, currently in transfer status.

ENVIRONMENTAL PHYSIOLOGY DIVISION

Mrs. Ann Clay
Editorial Assistant
EOB: July 1970

Mrs. Louise Jarrett
Editorial Assistant
EOB: November 1975

## PERSONNEL

(as of 31 December 1978)

### MILITARY PERSONNEL

**Medical Corps**

| | |
|---|---|
| Captains | |
| Internist (Hematologist) | 1 |
| Psychiatrists | 2 |
| Lieutenant Commanders | |
| Psychiatrist | 2 |
| Internist [ADDU] (Pulmonary Medicine) | 1 |

**Medical Service Corps**

| | |
|---|---|
| Commanders | |
| Microbiologist | 1 |
| Administrative | 1 |
| Lieutenant Commanders | |
| Psychologist, Aerospace | 1 |
| Psychologist, Clinical | 1 |
| Physiologist | 1 |
| Biochemist | 1 |
| Major, U.S. Army | |
| Sociologist | 1 |
| Lieutenants | |
| Psychologist | 1 |
| Physiologist | 1 |
| | 15 |

**Enlisted**

| | | |
|---|---|---|
| E-7 | HMC | 1 |
| E-6 | HM1 | 2 |
| E-5 | HM2 | 4 |
| E-4 | HM3 | 5 |
| E-3 | HN | 1 |
| | | 13 |

TOTAL 28

### CIVILIAN PERSONNEL

| Grade | Number |
|---|---|
| 10 USC 1581 | 2 |
| GS-14 | 2 |
| GS-13 | 7 |
| GS-12 | 6 |
| GS-11 | 11 |
| GS-9 | 13 |
| GS-7 | 10 |
| GS-6 | 6 |
| GS-5 | 11 |
| GS-4 | 5 |
| GS-3 | 1 |
| WG-5 | 3 |
| TOTAL | 77 |

In addition, there are several officers with additional duty to NHRC to serve on the Protection of Human Subjects Committee and the Facility Planning Board. They include one each of:

Commander - Chaplain Corps
Lieutenant Commander - Civil Engineer Corps
Lieutenant - Judge Advocate General Corps

## REPORTS COMPLETED IN 1978 *

78-1 Hoiberg, A
Causes of Hospitalization for Enlisted Navy Men and Women [ZF51.524.022-0001]

78-2 Moses, JM; A Lubin, P Naitoh, & LC Johnson
Circadian Variation in Performance, Subjective Sleepiness, Sleep, and Oral Temperature During an Altered Sleep-wake Schedule [MR041.01.03-0152]
*Biological Psychology, in press*

78-3 Naitoh, P; R Hilbert, LC Johnson & FW Hegge
Electrophysiological Sleep Survey
In: JI Martin & EA Calvers (eds), *Proceedings of the San Diego Biomedical Symposium, Vol. 17.* San Diego: San Diego Biomedical Symposium, 1978. pp 197-202
(DDC AD# A058-210) [ZF51.524.004-9016]

78-4 Johnson, LC
Records and Analysis of Brain Activity
In: P Venables & I Martin (eds), *Techniques in Psychophysiology, in press*
[M0096-PN.001-1029]

78-5 Van Vranken, EW & DM Benson
Family Awareness and Perceived Helpfulness of Community Supports
In: EJ Hunter & DS Nice (eds), *Military Families: Adaptation to Change.* New York: Praeger Publishers, 1978. Chapter 16, pp 209-221 [ZF51.524.022-0006]

78-6 Seales, DM, P Naitoh, & LC Johnson
Ethanol-Induced Changes in Performance and Mood as Measures of Acquired Tolerance in Social Drinkers [MR000.01.01-6006]

78-7 Hoiberg, A
Utilization, Health, and Performance of Enlisted Navy Women
In: *Proceedings, Training and Personnel Technology Conference.* Washington, DC: in press [ZF51.524.002-5020]

78-8 Reeves, DJ & RF Booth
Expressed vs. Inventoried Interests as Predictors of Paramedical Effectiveness
*Journal of Vocational Behavior in press* [M0096.PN.001-1031]

78-9 La Rocco, JM & EKE Gunderson
A Proposed New Outpatient Data Collection System [ZF51.524.002-5021]

78-10 Rahe, RH; L Hervig, M Romo, P Siltanen, S Punsar, M Karvonen, & V Rissanen
Coronary Behavior in Three Regions of Finland
*Journal of Psychosomatic Research, in press* [MF51.524.002-5020]

78-11 Bonnet, MH & LC Johnson
The Relationship of Arousal Threshold to Sleep Stage Distribution and Subjective Estimates of Depth and Quality of Sleep
*Sleep, in press* [M0096-PN.001-1029]

78-12 Hodgdon, JA, HW Goforth, & RL Hilderbrand
Carbohydrate Loading and Endurance in Naval Special Warfare Personnel
In: *Proceedings of the First RSG4 Physical Fitness Symposium with Special Reference to Military Forces.* Defence of Civil Institute of Environmental Medicine (DCIEM), Toronto, Canada, April 1978. pp 115-123 [M0099-PN.004-8050]

78-13 Looney, JG; RH Rahe, R Harding, HW Ward, and W Liu
Consulting to Children in Crisis [ZF51.524.002-5020]
*Child Psychiatry and Human Development, in press*

* Interested readers may obtain a copy of any report by addressing a request card to the senior author, Naval Health Research Center, San Diego, CA 92152. In the case of some of the reports with higher numbers, completed late in the year, there may be some delay because of time needed for journal review, refereeing, process of publication, and procurement of reprints.

78-14 Nice, DS
The Androgynous Wife and the Military Child
In: EJ Hunter & DS Nice (eds), *Children of Military Families: A Part and Yet Apart.* Washington, DC: Superintendent of Documents, U.S. Government Printing Office, 1978. pp 25-37 [ZF51.524.022-0006]

78-15 Johnson, LC; MW Church, DM Seales, & VS Rossiter
Auditory Arousal Thresholds of Good Sleepers and of Poor Sleepers With and Without Flurazepam (Dalmane)
*Sleep, in press* [M0096-PN.001-1029]

78-16 Butler, MC; JR Bruni, & EKE Gunderson
Motivational Determinants of Illicit Drug Use: An Assessment of Underlying Dimensions and their Relationship to Behavior [M4305.07-3009DFA5]

78-17 Nice, DS
Children of Returned Prisoners of War: Are there really second generational effects? [ZF51.524.022-0006]

78-18 Hutchins, CW
The Relationship Between Locus of Control and Resistance in a Simulated Prisoner of War Compound *(Center Publication)* [ZF51.524.022-0005]

78-19 Spaulding, RC
A Method for Quantifying a Mental Status Examination [ZF51.524.022-0005]
*(Center Publication)*

78-20 Hunter, EJ
Research on the Stresses of Wartime Captivity
In: *Proceedings of the 6th Biennial Psychology in the DoD Symposium*, 12 April 1978. Colorado Springs: U.S. Air Force Academy, in press [ZF51.524.002-0006]

78-21 Edwards, EA
Counterimmunoelectrophoresis and Double Immunodiffusion
In: MW Rytel (ed), *Rapid Diagnosis in Infectious Disease.* CRC Press, in press [M0095-PN.002-5045]

78-22 Spaulding, RC; LE Murphy, & JD Phelan
A Comparison Group for the Navy Repatriated Prisoners of War from Vietnam: Selection Procedures used and the Lessons Learned *(Center Publication)* [ZF51.524.022-0005]

78-23 Edwards, EA; P Muehl, E Sullivan, & MJ Rosenbaum
Immunological Characteristics of Influenza Precipitating Antibody as Demonstrated by Counterimmunoelectrophoresis [M0095-PN.002-5044]

78-24 Hord, DJ
Intensity Ratio, Coherence and Phase of EEG During Focused Attention [M4305.07-3008DAC5]

78-25 Church, MW & LC Johnson
Mood and Performance of Poor Sleepers During Repeated Use of Flurazepam
*Psychopharmacology, in press* [M0096-PN.001-1029]

78-26 Hilderbrand, RL
ELISA (Enzyme-Linked Immunosorbent Assay)
In: MW Rytel (ed), *Rapid Diagnosis in Infectious Disease.* CRC Press, in press [M0095-PN.002-5045]

78-27 Johnson, LC
Use of Physiological Measures to Monitor Operator State
In: *Proceedings, ARPA Conference on Biocybernetic Applications for Military Systems*, 5-7 April 1978, Chicago, in press [ZF51.524.002-5025]

78-28 Johnson, LC; DM Seales, P Naitoh, MW Church, & M Sinclair
The Effects of Flurazepam Hydrochloride on Brain Electrical Activity During Sleep
*EEG & Clinical Neurophysiology, in press* [M0096-PN.001-1029]

78-29 Butler, MC & AP Jones
The Health Opinion Survey Reconsidered: Dimensionality, Reliability and Validity
*Journal of Clinical Psychology, in press* [ZF51.524.002-5021]

78-30 Butler, MC & JM La Rocco
The Relationship Between Organizational Experience and Perceived Leader Behavior
[ZF51.524.002-5021]

78-31 Hunter, EJ & L Cheng (eds), *A Report on the Military Family Research Conference: Current Trends and Directions, September 1977.* San Diego: Naval Health Research Center, CPWS, 1978. [ONR Res. Proj. RR042-08-01; 61153N, NR 170-048; Naval PG School WR 70203]

78-32 Townsend, RE & LC Johnson
Relation of Frequency-analyzed EEG to Monitoring Behavior
*EEG & Clinical Neurophysiology, in press* [MR041.01.03-0153]

78-33 Rahe, RH
Center History and Future Course for the Center for Prisoner of War Studies, San Diego, California. In: *Proceedings of the 5th Annual Joint Medical Meeting Concerning POW/MIA Matters*, 19-20 Sept 1978, San Antonio, Texas, in press [ZF51.524.022-0005]

78-34 Jones, AP & MC Butler
A Role-Transition Approach to the Stresses of Organizationally-Induced Family Role Disruption [ZF51.524.002-5021 and 022-0006]

78-35 Hunter, EJ & JD Phelan
Resistance, Captor Treatment and Personality of the Vietnam Prisoner of War
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78-36 Booth, RF
Quality of Health Care--The Corpsman's Perspective [M0096-PN.001-1031]

78-37 Spaulding, RC
The PUEBLO Incident: A follow-up survey conducted eight years after the release of the USS PUEBLO crew from North Korea. *(Center Publication)* [ZF51.524.022-0005]

78-38 Van Vranken, EW
Current Status and Social Adjustment of U.S. Army Returned Prisoner of War
In: *Proceedings of the 5th Annual Joint Medical Meeting Concerning POW/MIA Matters*, 19-20 Sept 1978, San Antonio, Texas, in press [ZF51.524.022-0005]

78-39 Jones, AP & LR James
Organizational vs. Subsystem vs. Psychological Climate: What's in a name?
[ZF51.524.022-0007]

78-40 Booth, RF
Factor Stability of the Comrey Personality Scales
*Educational and Psychological Measurement, in press* [M0096-PN.001-1031]

78-41 Bailey, LW
Outpatient Mental Health Services in the Navy: Referral Patterns, Demographics, and Clinical Implications
*Military Medicine, in press* [M0096-PN.001-3014]

78-42 Jones, AP & LR James
Psychological Climate: Dimensions and Relationships of Individual and Aggregated Work Environment Perceptions
*Organizational Behavior and Human Performance, in press* [ZF51.524.022-5015]

78-43 Townsend, RE; DA Hall, & J Knippa
Clinical Applications of Neuropsychological Tests in the Diving Industry
In: *Proceedings of the Association of Diving Contractors, International Symposium*, 5-9 Feb 1979, New Orleans, Louisiana, in press [M0099-PN.001-3135]

78-44 Nice, DS
An Overview of the Family Studies Program at the Center for Prisoner of War Studies
In: *Proceedings of the 5th Annual Joint Medical Meeting Concerning POW/MIA Matters*, 19-20 Sept 1978, San Antonio, Texas, in press [ZF51.524.022-0005]

78-45 Edwards, EA; ME Kilpatrick, & D Hooper
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78-46 Pugh, WM & JM La Rocco
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78-47 Kolb, D & EKE Gunderson
Psychological Changes During Alcohol Rehabilitation by Type of Facility and Treatment Outcome [M0096-PN.001-1034]

78-48 Kolb, D; EKE Gunderson, & P Coben
Population Differences and Correlates of Post-Treatment Effectiveness in Alcohol Rehabilitation Facilities [M0096-PN.001-1034]

78-49 Hoiberg, A; S Berard, & J Ernst
Racial Differences in Hospitalization Rates Among Navy Enlisted Men [ZF51.524.022-0001]

78-50 Hoiberg, A; S Berard, & RH Watten
Correlates of Obesity [ZF51.524.022-0001]

78-51 Spaulding, RC; M Richlin, PF O'Connell, & G Holtzman
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78-52 Seales, CM; VS Rossiter, ME Weinstein, & JD Spencer
Brainstem Auditory Evoked Responses in Patients Comatose as a Result of Blunt Head Trauma *The Journal of Trauma, in press* [MR000.001.01-6020]

78-53 Rahe, RH; HW Ward, & V Hayes
Brief Group Therapy in Myocardial Infarction Rehabilitation: Three- to Four-Year Follow-up of a Controlled Trial *Psychosomatic Medicine, in press* [ZF51.524.002-5020]

78-54 Bailey, LW; MC Butler, & FA Thompson
The Health Opinion Survey in the Mental Health Clinic: Factor Structure and Diagnostic Relationships [M0096-PN.001-3014 and M0106-PN.001-0002]

78-55 Looney, JG & EKE Gunderson
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78-56 Hoiberg, A & J Ernst
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78-57 Looney, JG & EKE Gunderson
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78-58 Nice, DS & AL Beck
Cross Cultural Adjustment of Military Families Overseas [ZF51.524.022-0006]

78-59 Hermansen, LA; AP Jones, & MC Butler
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78-60 Kolb, D & EKE Gunderson
Comparison of Young Navy Alcohol Abusers and Drug Abusers on Demography, Personality, Performance, and Treatment Outcome [M0096-PN.001-1034]

78-61 Kolb, D & EKE Gunderson
Comparison of Alcohol Abusers Who Abused Other Drugs with Those Who Did Not [M0096-PN.001-1034]

78-62 Heckman, NA; D Kolb, & JG Looney
Prevalence of Alcoholism among Navy Hospital Inpatients [M0096-PN.001-1034]

78-63 Hammond, TJ: WB McHugh, DH Ryman, & RH Rahe
Aviator Stress During Replacement Air Group Training [ZF51.524.022-5020]

INCLUDED IS A LIST OF PAPERS PUBLISHED DURING 1978 BY STAFF MEMBERS, INCLUDING CHAPTERS IN BOOKS, BOOKS.

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*Lookout*, 1978, 90(11), 4-7

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*Personnel Psychology*, 1978, 31, 581-593

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A Critical Incident Approach to Determining Dental Auxillary Job Requirements
*Military Medicine*, 1978, 143(3), 183-187 [DDC #A057-473]

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*U.S. Navy Medicine*, 1978, 69, 21-23 [DDC #A056-870]

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Organizational and Environmental Influences on Health and Performance
In: BT King, S Streufert, & FE Fiedler (eds), *Managerial Control and Organizational Democracy*. Washington, DC: VH Winston & Sons, 1978. pp 43-60

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*Military Medicine*, 1978, 143(3), 168-170

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*Military Medicine*, 1978, 143(9), 635-638 [DDC #A063-888]

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Family Role Structure and Family Adjustment Following Prolonged Separation
*ibid.*, Chapter 14, pp 185-193

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In: CR Figley (ed), *Stress Disorders Among Vietnam Veterans: Theory, Research, and Treatment*. New York: Brunner/Mazel, 1978. pp 188-206

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*Journal of Drug Education*, 1978, 8(1), 19-28 [DDC #A063-786]

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Exercise Tolerance, Coronary Risk Factors, and Functional Aerobic Capacity of 35-55 Year-Old Military Personnel
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*Journal of Applied Psychology*, 1978, 63(5), 629-634

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*The American Journal of Psychiatry*, 1978, 135(6), 660-663 [DDC #A058-022]

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*The American Journal of Psychiatry*, 1978, 135(3), 304-308 [DDC #A057-744]

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*Psychophysiology*, 1978, 15(6), 569-575 [DDC #A064-233]

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*Journal of Human Stress*, 1978, 4(1), 3-15 [DDC #A056-696]

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*Psychosomatic Medicine*, 1978, 40(6), 478-486

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*Psychosomatic Medicine*, 1978, 40(2), 95-98 [DDC #A057-895]

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*Military Medicine*, 1978, 143(3), 171-174 [DDC #A053-281]

Tharp, VK
Ardie Lubin on Linear Regression: The Product-Moment Correlation and the One Predictor Linear Regression Model
*(Center Publication)*

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A Sex Comparison of Factors Related to Success in Naval Hospital Corps School
*Personnel Psychology*, 1978, 31, 95-106 [DDC #A063-278]

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EEG Event-Related Potentials and Signal Detection
*Biological Psychology*, 1978, 7, 13-28

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DURING 1978.....

FORMAL REPORTS of research findings were reported at national, international, and regional meetings of scientific and medical societies:

American Academy of Children Psychiatry, October, San Diego, California
"Evaluation of Adolescent Group Therapy" (LCDR Bailey)

American Association for the Surgery of Trauma, 15 September, Lake Tahoe, California
"Brainstem Auditory Evoked Response (BAER) in Patients who are Comatose as a Result of Blunt Head Trauma" (Dr. Seales)

American EEG Society, 7-10 September, San Francisco, California
"Flurazepam-induced Changes in Cerebral Electrical Activity" (Dr. Johnson)

American Psychological Association, 28 August - 1 September, Toronto, Canada
"Cognitive Complexity and Responses to Role Conflict and Role Ambiguity" (Dr. Jones)
"Crowding and Privacy Compared and Contrasted" (Mr. Pugh)
"Predicting Strain-related Disorders Among Career Navy Personnel by Occupation" (Ms Hoiberg)
"Social Support and Moods in the Work Environment" (Ms Hervig)
"The Alleged Double-bind in Military Psychology--does it have any validity?" (Dr. Wilkins)
"The Health Opinion Survey Reconsidered: Dimensionality, Reliability, and Validity" (LT Butler)
"The Influence of Workgroup Interdependence on the Effects of Job Stress" (Dr. Jones)
"The Military Family and the Military Organization" Symposium Chairman (Dr. Hunter)
"The Relationship Between Organizational Experience and Perceived Leader Behavior" (LT Butler)

American Psychosomatic Society Annual Meetings, March, Washington, DC
"Group Therapy in the Treatment of Post-Myocardial Infarction Patients. Results after 3-4 Years of Follow-up" (Dr. Rahe)
"Psychiatric Intervention in Acute Medical Illness" (Dr. Ward)

American Thoracic Society, May, Boston, Massachusetts
"Cardiopulmonary Consequences of Decompression Stress" (Dr. Neuman)

American Society of Microbiology, May, Las Vegas, Nevada
"Control Test Parameters for Bismuth Sulfite Agar" (CDR Sanborn)
"Counterimmunoelectrophoresis Detection of Meningococcus Carriers" (CDR Sanborn)
"Demonstration of Precipitating Antibody to Influenza A Infections by Counterimmuno-electrophoresis" (Mr. Edwards)

Association for the Psychophysiological Study of Sleep, April, Palo Alto, California
"Effects of Low Doses of l-tryptophan on Human Sleep" (Dr. Spinweber)
"Fusaric Acid and L-dopa; Effects on Sleep" (Dr. Spinweber)
"The Effect of Flurazepam, Pentobarbital, and Caffeine on Arousal Threshold" (Dr. Bonnet)
"The Relationship of Depth of Sleep (Arousal Threshold) to Subjective Depth and Quality of Sleep" (Dr. Bonnet)

Biomedical Symposium 1978, 1-3 February, San Diego, California
"Electrophysiological Sleep Survey" (Dr. Naitoh)

BioMonitoring Applications (BMA) Symposium, May, Chicago, Illinois
"A History of Stress and Disease Concepts" (Dr. Rahe)

California Sleep Society, 29 September, San Diego, California
"Review of Flurazepam Sleep Study" (Dr. Johnson)

DoD Conference, 'Review of Human Engineering R&D Related to Assignment of Women to Ships' 12 July, Washigton, DC
"Health and Performance Effectiveness of Navy Enlisted Women" (Ms Hoiberg)

Geigy Symposia Series, Rhode Island Medical Society, October, Providence, Rhode Island
"Life Stress and Depression" (Dr. Rahe)

International Diving Symposium, 29 January-2 February, New Orleans, Louisiana
"The Breath Heater and Humidified for Breathing Aparatus" (LCDR Hall)

Joint Medical Meeting Concerning POW/MIA Matters, 5th Annual; 19-20 September, San Antonio, Texas
"An Overview of the Family Studies Program at the Center for Prisoner of War Studies" (Dr. Nice)
"Center History and Future Course for the Center for Prisoner of War Studies, San Diego, California" (Dr. Rahe
"Current Status and Social Adjustment of U.S. Army Returned Prisoners of War" (Major Van Vranken)

Office of Naval Research, February, San Diego, California
"Current Shipboard Research" (Dr. Jones & LT La Rocco)

NASA/DoD Conference on Simulation, 30 January, Phoenix, Arizona
"In Air Visual Acquisition Performance on the ACMR" (LCDR Hutchins)

Psychology in the DoD, 6th Symposium; U.S. Air Force Academy, 20 April, Colorado Springs, Colorado
"Stress and Stress Management" [Chair symposium] (Dr. Hunter)

San Diego Psychiatric Society, March, San Diego, California
"Stress and the Psychiatrist" (Dr. Rahe)

Southwest Regional Inter-University Seminar Conference, 27-29 April, Dallas, Texas
"Causes of Hospitalization for Enlisted Navy Men and Women" (Ms Hoiberg)
"Women in the Military: To Discriminate or not to Discriminate" (Dr. Hunter)

Summit Conference of Industrial/Organizational Psychologist, January, San Diego, California
"Current Shipboard Research" (Dr. Jones)

Symposium on Physical Fitness with Special Reference to Military Forces, DCIEM, 3-5 April, Ontario, Canada
"Carbohydrate Loading and Endurance Performance in Naval Special Warfare Personnel" (LT Hodgdon)

Training and Personnel Technology Conference (TPTC), 16 February, Washington, DC
"Utilization of Women in Military Service" (Ms Hoiberg)

Undersea Medical Society, May, Boston, Massachusetts
"The Effect of Decompression and Asymptomatic Venous Gas Emboli on Pulmonary Gas Exchange (Cardiopulmonary Consequences of Decompression Stress)" (Dr. Neuman)

Undersea Medical Society, 28 April-1 May, Seattle, Washington
"Neuropsychological Evaluation of Divers Compared to a Nondiving Control Group" (Dr. Townsend)

USAF Behavioral Sciences Symposium, May, San Antonio, Texas
"Stress Medicine and the Military Environment" (Dr. Rahe)

Western EEG Society, February, Salt Lake City, Utah
"BAERS in Comatose Blunt Head Injury Patients" (Dr. Seales)

Western Psychological Association Meetings, 19-20 April 1978, San Francisco, California
"Correlates of Obesity" (Ms Hoiberg)
"Men and Women in the Military" (Ms Hoiberg)

World Psychiatric Association and the Egyptian Psychiatric Association, December, Cairo, Egypt
"The Life Setting in Which Mental Illness Occurs" (Dr. Rahe)

PRESENTATIONS of research findings were made at colloquia and meetings at universities and medical colleges:

Al Ahzar University, Microbiology Department, Cairo, Egypt; February & June (CDR Sanborn)

California School of Professional Psychology, San Diego; May (Dr. Jones)

Epidemiology Conference, University of Hawaii, Honolulu, 25 September (Dr. Gunderson)

Far West Region of Federal Laboratory Consortium (Techonlogy Transfer), San Diego, 11 August; Santa Clara, 13 September (Dr. Richlin)

Hematology Rounds, University of California at San Diego, La Jolla; Spring (Dr. Lang)

Organizational Psychology Panel (Sponsored by UCSD), San Diego; 11 January (Dr. Gunderson)

San Diego State University, San Diego; 11 July (Dr. Johnson)

Science Seminar, San Diego City College, San Diego; 2 March (Dr. Johnson)

University of Alexandria, Microbiology Department. Faculty of Medicine, Alexandria, Egypt; October (CDR Sanborn)

U.S. Naval Academy, Annapolis; August (Dr. Jones) "Effective Leadership in Naval Studies"

RESEARCH RESULTS were reported and discussions were led with hospital staff at these hospitals and clinics:

Air Stations: NAS North Island, 3 February; MCAS Yuma, 10 March; NAS El Centro, 28 March; and George AFB, 13-14 December (Dr. Johnson) "Consultant on Sleep Problems of Military Referrals"

Central Hospital Niamey, Niger, Ferbruary; and Centre Murza, Bobo-Dioulasso, Upper Volta, February (CDR Sanborn) "Rapid Diagnosis of Meningitis"

Harbor General Hospital, Department of Psychiatry, Torrance, California; October (Dr. Rahe) "Historical Considerations in Stress Research"

Letterman Army Medical Center, San Francisco; 22 September (Major Van Vranken) "Tri-Service Regional Meeting of Medical Social Workers, POW, and Family Reaearch"

Linda Vista Health Care Center, San Diego; 14 March (Dr. Hord)

Naval Regional Medical Center:
San Diego, Infectious Disease Department; June, September & October (Mr. Edwards)
San Diego, Trauma Service, February, "BAERS" (Dr. Seales)
San Diego, Neurology/Neurosurgery Services, March, "BAERS" (Dr. Seales)
San Diego, Independent Duty Corps School, 31 May, (Mr Pugh) "Morbidity Forecast Model"
San Diego, Psychiatry & Pediatric Services Conference, 12 September (Dr. Johnson)
San Diego, Psychiatry Service Conference, 16 February and 10 March (Dr. Johnson)
San Diego, Psychiatry & Pulmonary Services, 26-27 Sept, Clinical Evaluation (Dr. Johnson)
San Diego, Anesthesiology Department, Saturday Staff Seminar, 18 November (Dr. Johnson)
Bremerton, Briefing of Director, Occupational Health Services, September (Dr. Jones) "Illness Reporting Procedures"

Naval Shipyard Dispensary, Long Beach, 20 April, and Pearl Harbor, 26 September (Dr. Gunderson)

Naval Submarine Medical Center, Groton; 11 July (Dr. Johnson) "Consultant on Sleep Problems of Military Referrals"

Preventive Medicine Unit No. 5, San Diego, May and November (Mr. Edwards), "Counterelectrophoresis and their Use" and "Rapid Identification"

Public Health Laboratory, Manama, Bahrain; 18-12 October (CDR Sanborn)

University Hospital, San Diego (Dr. Ward), September, Medical House Teaching Staff Conference, "The Psychological Management of the Post-Myocardial Infarction Patient"
Fall, Lectures on Stress Research (Dr. Ward)

REPORTS READ OR DISCUSSIONS at other congresses or centers:

Coast Guard Association, San Diego; 14 November (Dr. Ward)
"Psychological and Physical Aspects of Occupational Stress"

Communicable Disease Surveillance Center, Colindale, England; 14 August (Mr. Edwards)
"Discussion of NHRC work and CDSC Techniques"

Conference on Alternatives to Surveys (Sponsored by ONR), Annapolis; 16-17 February (Dr. Gunderson)

DARPA Cybernetics Technology Conference, Chicago; 6-7 April (Dr. Johnson)
"Use of Physiological Measures to Monitor Operator State"

Family Awareness Conference, Norfolk; 8-10 November (Dr. Nice)

Institute of Psychiatry, St. Louis; 20 January (Dr. Johnson)
"Sleep: How Much, What Type"

National Institute for Biological Standards, London, England; 9 August (Mr. Edwards)
"Techniques of Storing and Retrieval of Microbial Agents"

Occupational Health Conference (sponsored by AMA), University of Arizona, Tucson; 13-16 September
(Dr. Gunderson)

Penninsula Lions Club, San Diego; 2 August (Dr. Johnson)
"Sleep Patterns and Health"

Radio Station KSDO, San Diego; 10 July (Dr. Johnson)
"Sleep Patterns and Health"

Santee-Lakeside Rotary, Lakeside; 31 August (Dr. Johnson)
"Sleep Patterns and Health"

The Institute for Advanced Psychological Studies, San Diego; August (Dr. Hord)
"Clinical Pre-licensing Workshop Instructor"

West Coast Preventive Medicine Conference, U.S. Navy, San Diego; 10 November (CDR Sanborn)
Lecture on "Rapid Diagnosis of Enteric Diseases in the Field"

LINE BRIEFINGS:

U.S. AIR FORCE

Brooks AFB, Behavioral Science Seminar, San Antonio; May (Capt Rahe)

Lackland AFB, San Antonio:
25 April, Capt R. D. Ballentine, USAF Occupational Management Center (Dr. Hunter)
23 June, Occupational and Manpower Research Division Personnel (Dr. Nice)
"Subj: NHRC's personnel selection study for the Defence Intelligence Agency.

USAF Academy, Colorado Springs:
22 April, General Tallman, Superintendent (Dr. Hunter)
15 May, Colonel John W. Williams, Head, Behavioral Science (Dr. Hunter)

USAF University of North Carolina, Chaple Hill; Major R. Brown, Chaplains Corps (Dr. Hunter)

U.S. ARMY

Brook Army Medical Center, Staff Members of Gastroenterology, Fort Sam Houston; 8 August
(Major Van Vranken) Subj: RPW personal and family interviews.

Colonel H. L. Taylor, Washington, DC; 16 February (Ms Hoiberg)
Subj: Utilization, health and performance of Navy enlisted women.

Office of the U.S. Army Surgeon General, Washington, DC;
18 August, Social Service Consultant (Major Van Vranken)
Colonel P. Darnauer (Dr. Hunter)

U.S. Army Health Services Command, Liaison Officer, San Antonio; 28 September (Major Van Vranken)

U.S. Army War College, Colonel R. Nichols, Carlisle Barracks, Penn. (Dr. Hunter)

U.S. MARINE CORPS

Commandant of the Marine Corps (Code MPP), Washington, DC; 13 July (Ms Hoiberg)
w/Majors Vitale and Nigrone, subj: Cancer incidence for Marine Corps personnel exposed to radiation.
w/Majors Cormady and Morton, LT Vermillion, and Mr. Chambers, subj: Longitudinal health patterns of Marine Corps personnel.

Marine Corps Recruit Depot, San Diego:
18 May, Major General R. C. Schulze, Commanding General; Brig. Gen. B. McClintock, Assistant Depot Commander, and various other officers, subj: Marine recruit stress study plans at MCRD San Diego. (Mr. Vickers & LCDR Ward)
Chaplains Dunks and Van Dalte (Dr. Hunter)

U.S.M.C. Headquarters, Washington, DC; 29 April (Mr. Vickers & LCDR Ward)
Major General J. H. Miller, Deputy Chief of Staff, Operations and Training, subj: Research plans for study of stress in Marine recruit training.

U.S. NAVY

Bureau of Naval Personnel (Pers 65), Washington, DC; 15 February (Dr. Gunderson)
subj: Alcohol studies.

Chief of Naval Personnel, Washington, DC:
16 February, Capt P. Butcher (Ms Hoiberg) Subj: Women in the Navy.
14 February, Pers-OR (Dr. Gunderson) Subj: Attrition studies

CINCPACFLT Medical Staff, Honolulu; March (LT Butler)
Subj: Outpatient Morbidity Reporting System

CINCPACFLT Medical Officer, Admiral Brown, Honolulu; 27 September (CAPT Lang, Dr. Gunderson, CDR Ferris) Subj: Shipboard Studies

CNET (Dr. N. Kerr), Washington, DC: 16 February (Ms Hoiberg)
Subj: ASVAB Scores

CNO (CDR M. M. Finklestein), Washington, DC; 17 February (Ms Hoiberg)
Subj: Neoplasia

CNO and COMSUBLANT representatives, New London, September (LCDR Hall & Dr. Townsend)
Subj: Conducted a stress, fatigue and work-rest cycle study during a full scale Deep Submergence Rescue Vehicle (DSRV) fly-away mission.

COMNAVSURFPAC Force Medical Officer, August and September (LT Butler)
Subj: Outpatient Morbidity Reporting System

COMPHIBGRUEASTPAC, San Diego; February (LT Butler & LT La Rocco), August (LT Butler)
Subj: Shipboard Studies

COMSUBPAC, 13-15 November (LCDR Hall)
Subj: Agenda and planning arrangement for conference on the medical and operational aspects of survivability and rescue of personnel in distressed submarines.

Commander Fleet Training Group, San Diego; February (LT Butler & LT La Rocco)
Subj: Engineering Studies

Commanding Officer, Naval Data Services Center, Bethesda (LT Butler)
Subj: Hospital Studies

Commanding Officer, USS DENVER (LPD9), March and June (LT Butler)
Subj: Shipboard Studies

Commanding Officer, USS BARBOUR COUNTY (LST 1195), June (LT Butler)
Subj: Shipboard Studies

Commanding Officers of USS VANCOUVER (LPD-2), USS MONTICELLO (LSD-35), USS RACINE (LST-1191), USS DURHAM (LKA-114); September (LT Butler)
Subj: Outpatient Morbidity Reporting System

Commanding Officers, USS MOBILE (LKA-115) and USS FORT FISHER (LSD-40), June (Dr. Jones and LT La Rocco) Subj: Shipboard Studies

NAVAIRPAC San Diego, January (Dr. Gunderson)
Subj: Habitability briefings.

Naval Attache, LCDR B. Decker, Hong Kong (Dr. Hunter)

Naval Personnel Research and Development Center, Captain Parker, Commanding Officer, San Diego; 19-20 October (Dr. Nice) Subj: Family Awareness Conference in Norfolk.

Naval Postgraduate School, Lt D. Sutter, School of Human Resources Department, Monterey; 14 April (Dr. Hunter)

Naval School of Health Sciences, Director of Research, Bethesda; 27-29 November (LT Butler)
Subj: Hospital Studies

Naval Special Warfare Group One, Chief of Staff, Amphib Base, Coronado; April (LT Hilderbrand and LT Hodgdon) Subj: An exercise diet program for increased endurance performance.

Office of Naval Research, Dr. Robert Hayles: (Ms Hoiberg) (Dr. Hunter)
16 Feb, subj: Navy Women Assigned to Traditional or Nontraditional Occupational Specialties (Hoiberg)

OpNav "Navy Nuclear Test Review", Captain A. Nelson; 1 May (Dr. Hunter)

SUBPAC, Pearl Harbor (LCDR Hall)
Subj: Entire undersea studies research program special emphasis on submersible and diver neuropsychological investigations.

SURFPAC Medical Officer, Captain Johnson, 26 May (Dr. Jones)
Subj: Briefing on Morbidity Forecast

U.S. Naval Hospital, Okinawa; Director, Administrative Services; April (Dr. Jones)
Subj: Morbidity Forecast

VADM Packer, COMMIDEASTFORCE (USS La Salle; Bahrain), 14 October (CDR Sanborn)
Subj: 1) Activities of NHRC
2) Preventive medicine problems and assistance for U.S.N. ships in Persian Gulf-mid East area.

RADM J. E. Langille, Commandant, Eleventh Naval District, San Diego (Dr. Nice)
Subj: Preparation for the Family Awareness Conference

RADM D. E. Brown, MC USN, Commanding Officer, Naval Regional Medical Center, San Diego, April (CAPT Rahe, Dr. Gunderson, Dr. Jones) Subj: Operational Medicine

RADM C. Williams (OP-59) (LCDR Hutchins)
Subj: In-air visual Acquisition

DEPARTMENT OF DEFENSE

Assistant Defense Attache, Seoul, Korea; March (Dr. Jones & LT La Rocco)
Subj: DIA Selection

DOD Conference on Infectious Disease, Bethesda (Mr. Edwards)

DOC Conference, Fifth Annual Joint Medical Meeting Concerning POW/MIA Matters, San Antonio, September (CAPT Rahe, Major Van Vranken, & Dr. Nice)

Defense Intelligence Agency, Dr. S. Frenkel; 14 February and 14 June (Dr. Nice, Dr. Hunter, Dr. Gunderson) Subj: Selection of Attaches, and Selection Study

General Accounting Officer, San Diego; 20 September (Ms Hoiberg)
Subj: Research on attrition of Navy personnel by occupation, sex, and race.

Navy Family Program, Dr. Anne O'Keefe, Executive Director (Dr. Nice & Dr. Hunter)
Subj: Importance and future direction of research on the military family.

Office of Medical Services, Mr. Jerry Rose, Executive Director, Department of State, Washington, DC; October (Dr. Nice), Subj: Importance and future direction of research on the military family.

The Honorable Robin Beard, House Armed Services Committee, House of Representatives, with information "advice and recommendations" concerning the all-volunteer force (Ms Hoiberg)

## COLLABORATION WITH OTHER RESEARCH FACILITIES

Members of the Stress Psychology Branch of Stress Medicine have collaborated in two ongoing studies with researchers from other institutions. A study of psychological factors affecting hormonal responses to stress was undertaken in cooperation with Dr. Holger Ursin of the University of Bergen (Norway) and Dr. Austin Darragh of the Biological and Medical Research Institute (Dublin, Ireland). In addition, Dr. H. W. Ward and Mr. Ross Vickers are collaborating with a research team from the University of Michigan headed by Dr. John R. P. French, Jr. The research funded by the Office of Naval Research, addresses the question of why men leave the Navy after 20 years service and what impact this change has on their health. Researchers in this branch are also frequently consulted about the measurement of life stress and stress tolerance. For example, Ms Linda Hervig assisted researchers at the Western Behavioral Sciences Institute in the development of a proposal submitted to the National Institute of Mental Health to study the effect of life stress and aging.

Dr. Milton Richlin, of the Prolonged Stress Branch (formerly Center for Prisoner of War Studies) served on a panel for the San Diego Technology Action Center which developed the concept of a Local Government Task Force designed to increase the flow of technology to local governments in the post Proposition 13 era; he now serves as a member of that task force.

The need for proper training for and methods of coping in captivity was discussed with Helicopter Squadron 10 by LCDR John Shale. Close cooperation with the SERE School at North Island in the evaluation of SERE training methods, and the application of knowledge gained from analysis of Vietnam captivity to the SERE program was carried on with LCDR Charles W. Hutchins.

Dr. Edna J. Hunter testified before a Joint House-Senate Sub-Committee meeting, a planning session for the 1980 White House Conference on the family.

The collaboration with the Naval Regional Medical Center Trauma Unit and the clinical services of Neurology and Neurosurgery, which began in 1977 with the Psychophysiology Branch of the Environmental Physiology Division, has continued during 1978. LT David M. Seales, MSC USN, and Valerie Rossiter continued to provide brainstem auditory evoked response data to aid in the diagnosis and treatment evaluation of patients in coma. This work culminated in the presentation and publication of papers which detailed the usefulness of this noninvasive measure of brainstem activity.

The clinical research branch located at the Naval Regional Medical Center was requested to provide diagnostic and consultative services to Neurology, Psychiatry, and Pulmonary services. These services referred patients who suffered from a variety of sleep disorders. With the increasing awareness of sleep disorders and the increasing awareness of the clinical research branch's studies of sleep problems, there has been an increased number of requests from both inpatient and outpatient sources. The outpatient calls, in addition to San Diego area bases, have come from Long Beach, El Centro, Yuma, Riverside, and New London. Also as a direct result of the increased interest in sleep problems, the staff has been asked to present lectures to the Anesthesiology staff as well as Psychiatry.

The contacts and collaboration with ARIEM, Natick, Mass., continued through 1978 as Dr. Naitoh continued data analysis from the joint, WRAIR, ARIEM, NHRC study of a Fire Direction Control Team during continuous performance exercises. Contacts with the Walter Reed staff have also continued.

As part of the Undersea Branch studies, close contact has been maintained with the operational staff of Submarine Development Group One (SUBDEVGRUONE). The flyaway deep submersible rescue missions have brought Dr. Hall into the operational activities of Submarine Forces, Atlantic. The data collection of divers off Hawaii necessitated collaboration with Submarine Forces, Pacific, and Reports to the Force Medical Officer. The Hawaii Research was also aided by close collaboration with the Department of Physiology, University of Hawaii. The diving studies have also involved frequent contact with the ONR sponsored University of Southern California Diving Research Station on Catalina Island. Joint Studies of oxygen saturation are being conducted with staff at the University of California, San Diego. The staff assisted SUBDEVGRUONE in the planning and conduct of an International Congress in Submarine Escape, Rescue, and Survival, held in San Diego. In addition to the above, the Undersea Branch staff are working with the training personnel of Amphibious Forces, Pacific, to develop a selection test battery for students applying for underwater demolition team training.

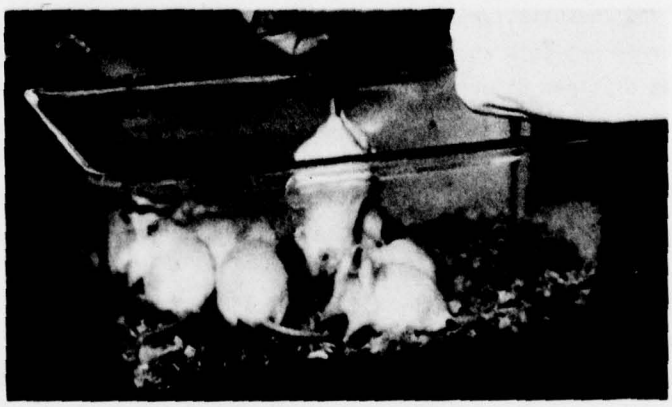
The Work Physiology Branch staff, with their laboratory at the Naval Training Center, have been providing physiological data to establish standards for treadmill exercise tests. They have become a ready source of data and consultation for the physical fitness staff at NTC.

Members of the Environmental Physiology Division continue to receive requests to present at university seminars, before local civic groups and clubs, and to participate in radio discussions of their research.

Members of the Biological Sciences Division collaborated with Preventive Medicine Unit No. 5, San Diego, on rapid identification of meningococci in their surveillance program by collection of sputum for mycoplasma pneumonia studies. With the Infectious Disease Department of the Navy Regional Medical Center, San Diego, on rapid identification of pneumococcal agents from patients admitted at NRMC with the diagnosis of pneumonia. A comparative study on diagnosis of bacterial pneumonia on 40 patients from whom 245 sputum samples were collected was conducted with the Infectious Disease Section of the University of Kentucky Medical School.

Foreign collaboration included the World Health Organization (W.H.O.) Eastern Mediterranean Regional Office to develop rapid test for cholera, and W.H.O. Headquarters' training program in diagnosis of enteric infections. Demonstration to the French Preventive Medicine, Association for the Promotion of Preventive Medicine, field test of the diagnostic field kit developed at NHRC.

Captain Rahe and Mr. Edwards are carrying out a stress-immunocompetence study, using mice as test animals in collaboration with Dr. James P. Henry, Department of Physiology, Univesity of Southern California.



The Environmental and Social Medicine Division collaborated with the Institute of Social Research, Dr. French, University of Michigan, in designing a study of retirement stresses in naval personnel; and with the Naval Dental Research Institute, Great Lakes, Captain Wirthlin and LCDR Cecil, to follow-up recruits with dental disease. Other follow-up studies include the Naval Medical Research Institute, Bethesda, Dr. Uddin, on the study of black recruits with and without sickle-cell trait; and with the Naval Medical Submarine Laboratory, New London, on the study of submarine personnel. Service history follow-up data was provided to Sandy Mumford, Ed Thomas, Pat Thomas, and Irv Curtis of Naval Personnel Research and Development Center for several of their projects.

## AWARDS AND HONORS

February 1 - Dr. Johnson, Fellow, American Association for the Advancement of Science.

May 7 - Dr. Ward received the Humanitarian Award, Vietnamese Community Foundation.

June 15 - Dr. Nice, Invited Fellow, Inter-University Seminar on Armed Forces and Society.

July 11 - Dr. Townsend received U.S. Patent No. 4, 099,282 for "Flotable Pole Marker Beacon".

## WORK FOR SCIENTIFIC JOURNALS

During 1978, staff members provided editorial input for numerous scientific journals:

Earl A. Edwards - *Journal of Clinical Microbiology* (Reviewer)
*Journal of Infectious Disease* (Reviewer)

E. K. Eric Gunderson - *American Journal of Psychiatry* (Reviewer)
*Diseases of the Nervous System* (Reviewer)
*Journal of Alcohol Studies* (Reviewer)

Anne Hoiberg - *Armed Forces and Society* (Special Editor)
*Psychological Reports* (Consulting Reader)
*Perceptual and Motor Skills* (Consulting Reader)

David J. Hord - *Biofeedback and Self-Regulation* (Consulting Editor)

Laverne C. Johnson - *EEG & Clinical Neurophysiology* (Consulting Editor & Reviewer)
*Sleep* (Reviewer)
*Psychophysiology* (Reviewer)
*Canadian Journal of Behavioral Science* (Reviewer)
*Psychopharmacology* (Reviewer)

Allen Jones - *Motivation and Emotion* (Consulting Editor)
Western Psychological Association Convention Program (Reviewer)

Julie Moses - *Psychophysiology* (Consulting Editor)
*Sleep Reviews* (Consulting Editor)

Paul Naitoh - *Waking and Sleeping* (Consulting Editor)
*Psychophysiology* (Consulting Editor & Field Reviewer)
*Educational Test & Measurement* (Cooperating Editor)
*EEG & Clinical Neurophysiology* (Field Reviewer)
*Psychological Reports* (Field Reviewer)
*Biological Psychology* (Field Reviewer)
*Quarterly Journal of Studies on Alcohol* (Field Reviewer)
*American Journal of Physiology* (Referee)

Richard H. Rahe - *Journal of Human Stress* (Editorial Board)
*Psychosomatic Medicine* (Editorial Board)
*General Hospital Psychiatry* (Editorial Board)
*Journal of Psychosomatic Research* (Editorial Board)
*American Journal of Psychiatry* (Consulting Editor)
*Archives of General Psychiatry* (Consulting Editor)
*Heart and Lung* (Consulting Editor)

Warren R. Sanborn - *Asian Journal of Infectious Disease, Singapore* (Editorial Board)

## ACADEMIC APPOINTMENTS

Some members of our staff teach, in the evenings, at local colleges. Senior scientists such as Captain Rahe, Dr. Gunderson, and Dr. Johnson hold Adjunct Professorships (honorary) at the University of California medical campuses in Los Angeles and San Diego. These ties with local universities and colleges serve to keep researchers up-to-date with the latest academic advances in their fields. Their appointments also speak for the acceptance of many of our staff and their work by academic appointment committees.

University of California at Los Angeles, Medical School

Captain Rahe, Adjunct Professor (Psychiatry)

University of California at San Diego, Medical School

Dr. Gunderson, Clinical Professor (Psychiatry)

Dr. Johnson, Adjunct Professor (Psychiatry & Neurosciences)

Captain Lang, Associate Clinical Professor (Medicine); Attending Hematologist

LCDR Hall, Department of Pediatrics, and Bioengineering Department

LCDR Neuman, Pulmonary Fellow (Medicine)

Dr. Spinweber, Adjunct Assistant Professor (Psychology)

CDR Ward, Clinical Instructor (Psychiatry)

San Diego State University

Dr. Johnson, Lecturer (Psychology, Professor level)

Dr. Jones, Lecturer (Psychology)

Dr. Spinweber, Lecturer (Health Care Administration External Degree Program)

Texas Christian University

Dr. Jones, Associate Professor (on leave)

Tufts University School of Medicine, Boston

Dr. Spinweber, Assistant Professor (Psychiatry) (on leave)

California School of Professional Psychology

Dr. Hord (Advances Psychophysiology; Doctoral Dissertation Supervision, Psychology and the Phiolosophy of Science)

Chapman College

LT Butler, Instructor (NAS Miramar Extension)

Grossmont College

LT Butler, Instructor (Psychology)

Mesa College

Mr. Englund, Instructor (Psychology)

## CONSULTANTS TO THE CENTER

CURRENT...

Dr. Ransom J. Arthur
Professor of Psychiatry and Assistant Dean for Educational Policy, Center for the Health Sciences, University of California at Los Angeles, Los Angeles

Dr. Ivan N. Mensh
Professor and Head of Medical Psychology, University of California at Los Angeles, Los Angeles

Dr. Robert T. Rubin
Professor of Psychiatry, B-4 Neurology Laboratory, Harbor General Hospital, Torrance

Dr. Donald O. Walter
Department of Anatomy, and Brain Research Institute, School of Medicine, University of California at Los Angeles, Los Angeles

Dr. Walter L. Wilkins
3258 Trumbull St., San Diego

PAST...

| | | |
|---|---|---|
| Norman Q. Brill, M.D. | John G. Looney, M.D. | Julius Sendroy, Jr, Ph.D. |
| William C. Dement, M.D. | George A. Mansfield Jr., Ph.D. | Ernest S. Tucker, III, M.D. |
| Wilfried J. Dixon, Ph.D. | Mrs. Iris R. Powers | Thomas L. Trunnell, M.D. |
| Richard F. Docter, Ph.D. | Ralph W. Ritchie, Ph.D. | Richard D. Walter, M.D. |
| John R. P. French, Ph.D. | Jon F. Sassin, M.D. | Leonard M. Zunin, M.D. |
| Reuben L. Hill, Ph.D. | Marc A. Schuckit, M.D. | |
| Donald B. Lindsley, Ph.D. | Saul B. Sells, Ph.D. | |

## ACKNOWLEDGEMENTS

The highlights of research for 1978, for each scientific division, were written by Dr. Walter L. Wilkins; the other sections were prepared by Mrs. Brenda Crooks. With the exception of photographs on pages 23 and 26, all photography was done by Rick Koch, Laboratory Technician, Biological Sciences Division, NHRC.